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EVALUATION OF THE COMPETENCE OF AUTHORS AS A FUNCTION OF THE AUTHOR'S GENDER, THE SEX-RELATEDNESS OF THE ARTICLE, AND THE SEX OF THE EVALUATOR

by

TIMOTHY FULLERTON

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE

OF MASTER OF ARTS

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EVALUATION OF THE COMPETENCE OF AUTHORS AS A FUNCTION OF THE AUTHOR'S GENDER, THE SEX-RELATEDNESS OF THE ARTICLE, AND THE SEX OF THE EVALUATOR

by

TIMOTHY FULLERTON

A dissertation submitted to the Faculty of Graduate Studies of the University of Manitoba in partial fulfillment of the requirements of the degree of

MASTER OF ARTS

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THE UNIVERSITY OF MANITOBA

FACULTY OF GRADUATE STUDIES

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies for acceptance, a Master's thesis entitled: "Evaluation of the Competence of Authors as a Function of the Author's Gender, the Sex-relatedness of the Article, and the Sex of the Evaluator."

submitted by John Timothy Fullerton

in partial fulfilment of the requirements for the degree of

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Date August 20, 1974

Oral Examination Requirement is:

Satisfactory ☑ Not Required ☐

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ABSTRACT

Previous research on sex bias by Goldberg (1968) and Pheterson, Kiesler and Goldberg (1971) has concluded that women downgrade the work of members of their own sex. However, a careful reading of these studies, in conjunction with recent evidence on the importance of balancing experimental tasks for sex-relatedness, suggests that their findings may have been an artifact of several procedural errors in the standardization of their experiment stimuli, and this present study investigates this possibility.

148 male and 140 female introductory psychology students attending the University of Manitoba served in an initial experiment designed to test the perceived sex-relatedness of the tasks used by Goldberg and Pheterson et al. The results indicated that these stimuli were not adequately sex balanced.

98 male and 98 female subjects from the same population served in a replication of the Goldberg (1968) experiment which utilized a properly sex balanced set of seven professional articles as stimuli. The results of this experiment revealed that neither male nor female subjects valued the articles or their authors differently as a function of the author's sex and thus gave no support to Goldberg's assertion that, women downgrade the work of professionals of their own sex.

Several possible explanations for these results are discussed and suggestions are made for future research.

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INTRODUCTION

Until recently the research on sex and conformity presented a reasonably consistent picture: females conform more than males (Krech, Crutchfield and Ballachey, 1962). Indeed, Freedman, Carlsmith, and Sears (1970), in a discussion of the individual characteristics which have been found related to conformity, state, "The most consistent and strongest factor that differentiated people in the amount they conform is their sex. Women conform more than men...This difference between men and women has been found in virtually every study in which both sexes participated (p. 239)". Another reviewer (Nord, 1969), in a recent summary of the literature wrote, "It has also been well established at least in our culture, that females supply greater amounts of conformity under almost all conditions than males (p. 198)".

But, as is often the case in a maturing science, this "truth" has been seriously challenged by subsequent experimentation. In an analysis which parallels the realization that IQ tests can inadvertantly be "culture-bound", McDavid and Sistrunk (1964) suggested that nearly all of the research which found females more conforming used male-oriented tasks and materials. They then found that if sexually neutral judgments (McDavid and Sistrunk, 1964; Sistrunk and McDavid, 1965) were involved in a Crutchfield-type conformity situation (Crutchfield, 1955), males and females conformed to equal extents.

Sistrunk and McDavid (1971) subsequently tested the hypothesis that either sex will conform more when judging matters deemed to be part of the other sex's cultural sphere. A paper-and-pencil "opinion survey"

was composed containing an equal number of male and female oriented items. This survey was then administered to four samples of high school and college students, with bogus "majority responses" printed alongside each item. In all four samples a significant sex of subject x sex of judgment interaction was found, with females being more conforming on male oriented problems, and males being more conforming on female oriented problems. There was no difference between males and females in overall conformity in any of the samples.

These results are in accord with earlier findings (Coleman, Blake and Mouton, 1958; Snyder, Mischel and Lott, 1960) that persons conform most to social pressure when the task is unfamiliar. Furthermore, they have recently been replicated in a face-to-face compliance situation. Fullerton and Altemeyer (1974) had male and female experimenters try to influence male and female subjects' stated opinions about matters previously determined to be (equally) either male oriented (legal responsibility in automobile accidents) or female oriented (color and pattern coordination in clothing). The same significant sex of subject x sex of judgment interaction which Sistrunk and McDavid (1971) found was obtained again. In addition, the male subjects conformed significantly more overall, due to their relatively high level of conformity on the female oriented task.

It would seem then that the conclusion that "females supply greater amounts of conformity under almost all conditions" would be in some difficulty. The error is understandable, since the conclusion is based on the many studies which largely investigated conformity on

male orfented tasks. But the research referred to above, which controlled for the sexual orientation of the task, did not find females more submissive, and the more legitimate conclusion about sex and social influence would seem to be "It depends on the task".

There are, however, several contradictory findings in a related area of research. Both Goldberg (1968) and Pheterson, Kiesler and Goldberg (1971) investigated the attitudes of female college students toward professional work attributed to men or women. The professional work judged was selected by the investigators to control the sex relatedness of the field. And yet in both studies it appeared that "women were prejudiced against women" -- rating works attributed to women lower than the same works when attributed to a man. In short, significant amounts of female submissiveness have been reported in two studies which attempted to control for the sex relatedness of the issue.

The Goldberg and Pheterson et al. findings although not part of the traditional conformity literature may be related to it. Whereas conformity has traditionally been defined as submissiveness to external social influence this tendency for females to rate works attributed to a woman lower than the same works when attributed to a man may be considered submissiveness to a learned or internal social influence.

One <u>could</u> draw a distinction between submissiveness in conformity situations and submissiveness in these other studies, and thus, in effect, ignore the contradiction in the literature. Perhaps the situations really are so different that the conflicting findings are both valid in their own sphere. But that conclusion should only be drawn if attempts to reconcile the conflict fail, and it is possible

that methodological shortcomings have produced the contradiction where one really does not exist. Specifically, this paper will test the proposition that both the Goldberg results and the Pheterson, Kiesler and Goldberg (1971) findings resulted because the materials judged by the subjects were not really balanced for sex orientation, but instead were male oriented, as has happened so often before.

The Goldberg (1968) Study

Goldberg's (1968) paper, which has since been widely cited (Bem, 1970; Bem and Bem, 1970; Deaux and Taynor, 1973; Feldman-Summers and Kiesler, in press; Franklin and Kohout, 1973; Gergen, 1974; Levitin and Chananie, 1972; Parlee, 1972; Rice and Rice, 1973; Rosen and Jerdee, 1973; Wrightsman, 1972; Womach, Butler, Cochran and Wagner, 1973) as demonstrating that women are prejudiced against women, tested the following hypothesis:

> "Even when work is identical women value the professional work of men more highly than that of women. But, when the professional field happens to be one traditionally reserved for women, this tendency will be reversed, or at least greatly diminished (p.29)".

Recognizing the need to standardize materials for sexual orientation, Goldberg first gave 100 college women a list of 50 occupations and asked them to rate "the degree to which you associate the field with men or with women (p. 29)". He found that the occupations of law and city planning, among others, were strongly associated with men, and that elementary school teaching and dietetics were strongly associated with women. Two other fields, linguistics and art history were not strongly associated with either sex, and hence were selected as neutral occupations. Goldberg then obtained an article from the professional litera-

ture of each of these six fields, and edited and abridged them to about 1500 words. He also deleted the original author's name and for each article replaced it with either a man's name (e.g., "John T. McKay") or a woman's name ("Joan T. McKay"). The articles were then arranged in two sets of booklets, each of which contained three male and three female authors, and distributed among forty university females. The subjects were asked to "critically evaluate" each of the six articles in their booklets on a series of dimensions such as value, persuasiveness, and profundity, and to rate the authors for such attributes as writing style, professional status, and ability to sway the reader.

To summarize, then, Goldberg's (1968) study involved a 3 x 2 factorial experiment (sexual orientation of field and sex of author) with the latter factor balanced across two modes of presentation. The results were not presented in terms of a standard analysis of variance, unfortunately, but through a series of internal comparisons on sum scores; Goldberg found that the female subjects

1. evaluated the male oriented articles significantly more positively when the article was attributed to a man;
2. Also evaluated one of the "neutral articles (linguistics) significantly more positively when it was attributed to a man; and
3. Did not evaluate the female oriented articles more positively when attributed to a woman.

On the basis of these results, Goldberg concluded, "Women, at least these young college women, are prejudiced against female professionals

and, regardless of the actual accomplishments of these professionals, will firmly refuse to recognize them as the equals of their male colleagues (p. 30)".

The Pheterson, Kiesler and Goldberg (1971) Study

The Pheterson et al. (1971) study has been cited (Deaux and Taynor, 1973; Feldman-Summers and Kiesler, in press; Rosen and Jerdee, 1973) as replicating Goldberg's (1968) findings. These researchers tested two main hypotheses: (1) women will evaluate male attempts to accomplish more highly than female attempts, and (2) women will evaluate female accomplishments as equal to or better than male accomplishments. A total of 120 college women, serving in small groups, were given booklets with the following directions:

> "Slides of eight paintings will be shown in conjunction with brief biographical sketches of the artists. After viewing the slide turn the page and answer five evaluative questions about the painting. No personal information about your identity talents, or tastes is required. This is a study of the artistic judgments of college students (p. 115)".

Eight unknown contemporary paintings were then presented for evaluation. The sex of the artist and the status of the painting were manipulated within the biographical profiles, such that for each painting half of the subjects thought it had been created by a man, and half thought it had been created by a woman. Across these conditions half of the subjects thought the paintings had won a prize and half thought it was merely an entry in a contest. After each slide, subjects responded to five questions asking them to evaluate the artist's technical competence, creativity, overall quality and content, emotional impact and artistic future.

In summary, the Pheterson et al. (1971) study manipulated the sex of the artist and the status of the painting (entry or winner). Each subject participated in each experimental condition, evaluating all eight paintings sequentially. The identity of each painting was counterbalanced among subjects, so that all conditions were represented at each presentation of the stimulus.

An analysis of variance indicated that only the questions dealing with technical competence and artistic future showed any effect. On these questions it was found that the subjects (1) judged entry paintings by men to be significantly better than the identical paintings by women; but (2) winning paintings were not evaluated differently. It is the first of these findings in conjunction with their assertion that the task was neutral which, like the results of the Goldberg (1968) study, conflicts with the emerging conclusion that females are no more submissive than men when the sexual orientation of the task is controlled.

Possible Methodological Shortcomings of these Studies

Did Goldberg (1968) and Pheterson et al. (1971) really control the sexual orientation of their tasks? Since professional articles were used as the stimuli in Goldberg's experiment, the appropriate standardization question should have been whether either sex was more likely to write an article in the professional literature in each area. Instead, it will be recalled, the subjects rated the degree to which they associated each field *per se* with males or females. It may be that college students associate a field such as elementary education with women because of the large number of females employed in this occupation. But

this does not mean subjects perceive women to dominate the professional literature on elementary education.

Secondly, Goldberg reports that he selected an article to represent each of the areas included in the study, but he does not say how he chose them. Since articles can differ on many dimensions, including the subject matter sampled from the occupation area, there is no information that the articles chosen truly represented the sex-relatedness of the area as a whole. Since particular articles within occupational areas were the actual stimuli used in the experiment these articles must also be objectively standardized for perceived sex-relatedness.

In the Pheterson et al. study neither the broad area (paintings entered in a museum sponsored art contest) nor the individual paintings themselves were standardized in a formal manner. The authors perhaps assumed that the paintings would be perceived to be equally likely the works of a male or a female. But this seemingly important consideration was not tested.

Statement of the Problem

Because of these potential problems with the stimuli both Goldberg (1968) and Pheterson, Kiesler and Goldberg (1971) used, it is difficult to agree that they show what they appear to show. The present study was therefore undertaken to determine,

(1) if the test stimuli used in these two experiments really were adequately sex balanced, and if they are not,

(2) would "women be prejudiced against women" if appropriately

balanced stimuli were used in the "Goldberg paradigm".

EXPERIMENT I

The intention of our first experiment was to test the perceived sex-relatedness of the tasks used by Goldberg (1968) and Pheterson et al. (1971) when a seemingly more appropriate standardization question was asked. The specific hypotheses were (1) the occupational areas used by Goldberg (1968) would not be adequately sex-balanced and (2) the stimulus category used by Pheterson et al. (1971) would not be perceived as neutral.

Method

A total of 148 male and 140 female introductory psychology students at the University of Manitoba were given the four sex-related tasks used by Goldberg (1968) and the situation used by Pheterson et al. (1971) and asked to indicate their opinion of the sex-relatedness of each activity. The subjects, tested in six groups of about 50, encountered the experimental materials at the end of an attitude survey on which they had worked for approximately forty minutes. The attitude survey was part of another research project and is not relevant to our purposes here. There was no sex-related material *per se* in the attitude survey.

The task was introduced with the following instructions:

> "Below are a series of questions which ask you to estimate the percentage of men and women engaged in various activities. Of course, you probably do not know the exact percentages in each case, but please make your best estimate in every instance. Please circle only one value on each scale".

A series of questions and accompanying rating scales followed these

instructions which took the following general form:

> "What percentage, in general, of the articles published in the professional field of law would you estimate are written by men and women?"

Two forms, each containing three questions, were used in this experiment. Form A tested the two male-related occupational areas Goldberg (1968) utilized (law and city planning) plus the neutral area used by Pheterson et al. (1971) (paintings entered in a museum sponsored art contest). Form B presented the female-related areas Goldberg (1968) used (dietetics and elementary education) as well as the Pheterson et al. (1971) stimulus category. One form (either A or B) was randomly distributed to each subject, with approximately equal numbers of male and female subjects completing each version of the questionnaire. The question asked, to test the Pheterson et al. neutral area, was slightly different from that used for the others to take account of the difference in the behavior involved:

> "What percentage, in general, of the paintings entered in a museum sponsored art contest would you estimate are painted by men and women?"

Results

Figure 2 shows the mean ratings, by sex of subject, of the tasks used in the studies in question. It can be seen that females perceive the literature on city planning ($\bar{X}$ = 78.6% male-related) and law ($\bar{X}$ = 77.2% male-related) as highly dominated by males. Entering paintings in a contest ($\bar{X}$ = 59.7% male-related) as an activity seen as slightly more likely to be engaged in by men than by women, but the field of elementary education ($\bar{X}$ = 51.9% male-related) is not clearly associated with either

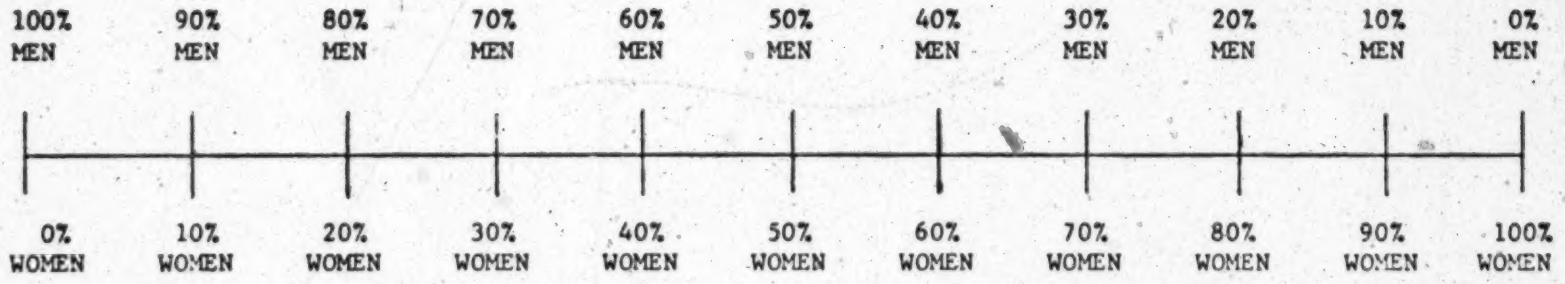
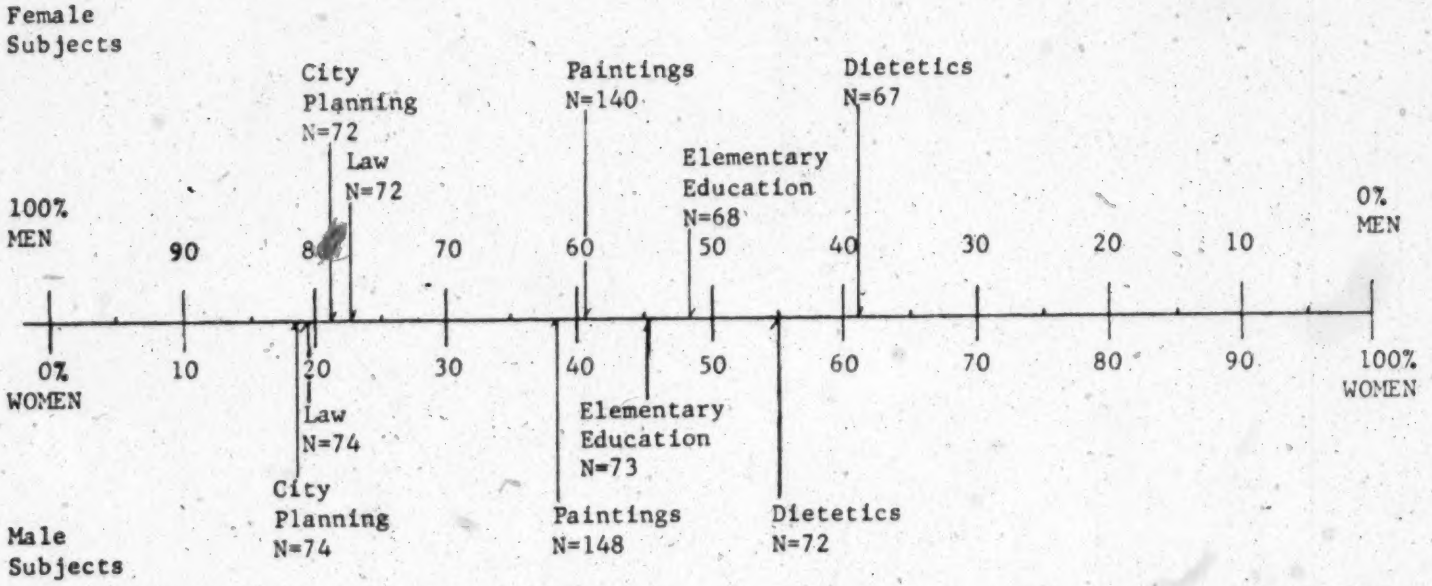


Figure 1. Rating Scale employed in Experiment I and the standardization of occupational areas (A and B).



Note: Goldberg (1968) conducted his standardization using college women, thus the data from female subjects constitutes the pertinent comparison. We standardized using both men and women - to prepare for a larger test of the question Goldberg was asking.

Figure 2. Mean Ratings by sex of subject, of the sex-related task used by Goldberg (1968) and the neutral task employed by Pheterson, Kiesler and Goldberg (1971), when the more appropriate standardization question was asked.

sex. In fact, dietetics ($\bar{X}$ = 38.8% male-related) is the only area whose literature is perceived to be female dominated and then only to a slight extent. The male subjects' ratings closely approximated those of the female subjects. However, the tendency was for male ratings to be more male-oriented than female ratings, or vice versa. This trend was seen in all the areas tested.

Discussion

It would appear that when tested by the more appropriate standardization question - "What percentage of the articles written in a professional field are written by men or women", instead of "rate the degree to which you associate the field with men or with women" - the fields used by Goldberg (1968) do not constitute a sex-balanced set of stimuli. Although the literature on law and city planning are perceived to be dominated by men it is evident that the literature on elementary education and dietetics are not perceived to be equally female-dominated. In fact, elementary education is perceived as a neutral literature, while that on dietetics is clearly not female-related to the same extent that law and city planning are male-related.

The results of this experiment also show that the task (entering paintings in a contest) used by Pheterson et al. was not perceived to be sexually neutral but, in fact, is male related as predicted.

It is possible that had we asked our question of Goldberg's subjects, we would have gotten a different result. But if that is not the case it is maintained that these findings support our hypotheses that the stimuli used by both Goldberg and Pheterson et al. were not

adequately sex balanced.

EXPERIMENT II

Experiment I suggests that whether "women are prejudiced against women" is a hypothesis that has not been adequately confirmed. A methodologically sound test of Goldberg's (1968) hypotheses would require a properly sex balanced set of stimuli. To this end a systematic standardization of occupational areas was undertaken as a first step in deriving a properly sex balanced set of articles.

The standardization of our stimuli was undertaken with two aims in mind. Firstly, we wanted to determine a female-dominated literature which could provide a balance to one of the extremely male related areas (law or city planning) used by Goldberg (1968). Considering the results of Experiment I and the traditional male dominance in our culture we anticipated some difficulty in this task. Secondly, our understanding of the hypotheses tested, would be enhanced if we could plot trends in our data. For this purpose we sought to identify a series of occupational literatures which were perceived to be male and female dominated to varying extents.

Method A

A total of 71 male and 77 female subjects, from the same population used in Experiment I took part in this phase of the standardization. None of these subjects had served in Experiment I.

The procedure, instructions, question form, and rating scales used were identical to those employed in Experiment I, except that all

subjects rated all twelve occupational literatures. Three professional literatures were rated on each of four pages, with the pages systematically rotated into four different kinds of booklets.

Results and Discussion

The mean sex-relatedness of the twelve occupational literatures are given in Table 1. It will be noted that all percentages are given as percent male-related. Also, unweighted means are utilized when the male and female subjects' scores are collapsed to avoid distortion due to the unequal sample sizes.

It can be seen that our sample of literatures included one of Goldberg's (1968) "neutrals" viz., linguistics. Our judges rated it as being a somewhat male-oriented literature ($\bar{X}$ = 60.8% male-related)[1].

Inspection of the ratings contained in Table 1 reveals a fair range of male- and female-related literatures and hence some basis for proceeding with our replication of Goldberg's study. However, no female-related literature was found to match the male-relatedness of either law or city planning, hence a second set of occupations were sampled.

Method B

A total of 71 male and 64 female introductory psychology students took part in this second phase of the standardization.

The occupational areas, architecture, home economics, biology,

---

[1]The remaining stimulus-literature used by Goldberg, art history, was judged by 29 male and 30 female subjects later. It's ratings were also on the male-oriented side (64.5% and 64.0% male-related, respectively).

TABLE 1

Mean Sex-Relatedness of Occupational Literatures by Sex of Subjects and Collapsed Over Sex of Subjects

Occupational Areas	N	Sex-Relatedness Male Subjects	N	Sex-Relatedness Female Subjects	N	Sex-Relatedness Unweighted Means
Physical Education	69	71.2%	77	66.1%	146	68.6%
Home Management	71	38.4%	77	35.2%	148	36.8%
Nursing	70	35.6%	77	35.8%	147	35.7%
Library Science	67	54.2%	76	52.1%	143	53.2%
Social Work	71	53.2%	77	49.5%	148	51.4%
Secretarial Science	69	40.5%	75	38.0%	144	39.2%
Anthropology	67	71.2%	77	67.7%	144	69.4%
Natural Childbirth	71	52.3%	77	50.3%	148	51.3%
Women's Fashions	70	39.9%	77	37.0%	147	38.4%
Clothing & Textiles	70	44.3%	77	41.4%	147	42.8%
Etiquette	66	35.2%	77	28.0%	143	31.6%
Linguistics	64	61.8%	76	59.7%	140	60.8%

Note: All percentages are percent male-related. Slight discrepancies between N's for each occupational area are due to subjects not answering the question or marking the rating scale ambiguously.

midwifery, interior design, and psychology were tested for perceived sex-relatedness of their literatures. The procedure, instructions, question form, and rating scales used were identical to those employed in Experiment I. All 135 subjects rated the same six occupational literatures. Three professional literatures were rated on each of the two pages, with the pages counterbalanced into two different kinds of booklets.

Results and Discussion

The mean sex-relatedness of the six additional literatures are listed below in Table 2. Again all percentages are given as percent male-related.

It can be seen that the literature on home economics was nearly equally opposite to the male-related literature on law, thus the first aim of our standardizations was met. The data gathered in Experiment I and the subsequent standardizations produce a reasonably balanced seven-point scale of sex-related literatures, depicted in Figure 3. But we were not yet ready to proceed with the "Goldberg experiment" itself because professional articles selected from our standardized occupational literatures were to be the experimental stimuli. The occupational areas represented on our seven-point scale were used as a guide for the selection of these professional articles.

EXPERIMENT III

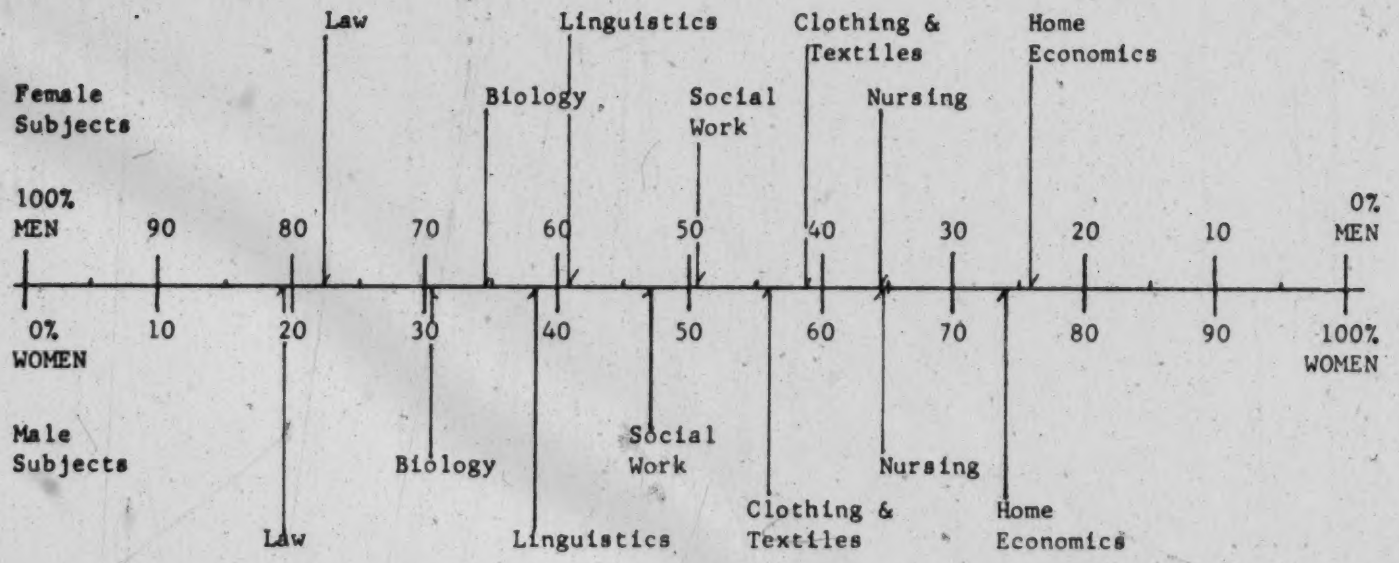
Goldberg did not describe how he selected articles to represent

TABLE 2

Mean Sex-Relatedness of Occupational Literatures by Sex of Subjects and Collapsed Over Sex of Subjects

Occupational Areas	N	Sex-Relatedness Male Subjects	N	Sex-Relatedness Female Subjects	N	Sex-Relatedness Unweighted Means
Architecture	71	80.4%	63	79.8%	134	80.1%
Home Economics	70	25.6%	64	23.3%	134	24.4%
Biology	70	69.9%	62	65.6%	132	67.8%
Midwifery	66	41.5%	63	38.0%	129	39.8%
Interior Design	71	43.6%	61	38.9%	132	41.2%
Psychology	71	65.4%	62	61.5%	133	63.4%

Note: All percentages are percent male-related. Slight discrepancies between N's for each occupational area are due to subjects not answering the question or marking the rating scale ambiguously.



Note: T-tests conducted on each of these seven areas reveal no significant differences between the ratings of male and female subjects.

Figure 3. Mean ratings, by sex of subject, of the seven occupational literatures selected as a balanced scale.

the literature used in his study. But individual articles contain idiosyncratic cues which may influence their perceived sex-relatedness. For example, an article taken from the literature on elementary education may have as its primary subject matter a discussion of a new curriculum for a school system or an author's advice on how to handle "crushes" on a teacher. A reader of these articles may form very different opinions about the sex, and inferred expertise, of the author in each case. Therefore, we sought to identify articles which would connote the relative sex-relatedness of the seven literatures identified in Experiment II.

Method

Altogether an additional 240 male and 240 female subjects were needed to standardize the occupational articles. The subjects were drawn from the same population and were tested in the same way as those used in the preceding study.

Each subject received a booklet which contained three or four articles counterbalanced for order of presentation. Approximately equal numbers of male and female subjects completed each version of the booklet. Each article in the booklet was introduced with the following instructions:

> "The following is an article taken from the professional literature in its field. Please read the article carefully and answer the question at the end".

The subjects then encountered an article, of approximately 2000 words, which in turn was followed by the instructions, "Estimate the probability that the article you have just read was written by a man or a

woman". Subjects gave their estimate on the rating scale depicted in Figure 4.

It was necessary, in four cases, to test several articles from an occupational area, before an article which matched the perceived sex-relatedness of that area's literature as a whole could be determined.

Results and Discussion

Table 3 displays the mean perceived likelihood that each of the fifteen articles tested was written by a man or a woman.

The immediate impression one receives, on viewing Table 3, is that there is high variability of ratings within an area. Articles from the same occupational area may vary widely in their perceived sex-of-authorship ratings. For instance, the overall sex-of-author ratings received by the four linguistics articles tested, range from 53.8% to 68.3% likely written by a man. These particular findings plus the number of attempts necessary to obtain appropriate law, biology, and home economics articles reinforce our concern that articles used in a "Goldberg-type" test of sex discrimination should be standardized for perceived sex-of-authorship.

It will be observed that the biology, linguistics, social work, clothing and textiles, and nursing articles closely represent the author-sex-dominance of their respective literatures. However, our attempt to place articles on the extremes of the continuum (law and home-economics) was less successful. It may be that when subjects are asked to estimate, "what percentage, in general, of the professional

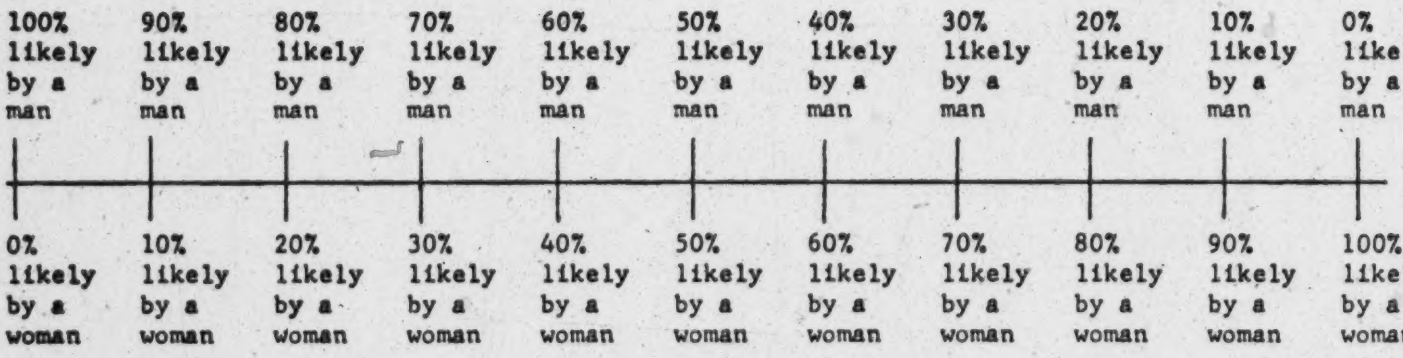

100% likely by a man
90% likely by a man
80% likely by a man
70% likely by a man
60% likely by a man
50% likely by a man
40% likely by a man
30% likely by a man
20% likely by a man
10% likely by a man
0% likely by a man
0% likely by a woman
10% likely by a woman
20% likely by a woman
30% likely by a woman
40% likely by a woman
50% likely by a woman
60% likely by a woman
70% likely by a woman
80% likely by a woman
90% likely by a woman
100% likely by a woman

Figure 4. Rating scale employed in the standardlization of occupational articles

TABLE 3

Mean Perceived Likelihood of Articles Being Written by a Man, by Sex of Subject

Occupational Articles	Male Subjects	N	Female Subjects	N	All Subjects	N	Sex-Relatedness of Occupational Literature (From Tables 1 & 2)
Law (1st Attempt)	61.7%	49	58.6%	59	60.2%	108	78.8%
Law (2nd Attempt)	64.2%	36	61.4%	48	62.8%	84	"
+Law (3rd Attempt)	75.5%	41	71.6%	53	73.6%	94	"
Biology (1st Attempt)	60.8%	51	59.6%	41	60.2%	92	67.8%
Biology (2nd Attempt)	66.5%	39	64.1%	43	65.3%	82	"
*Biology (3rd Attempt)	67.1%	45	65.8%	50	66.4%	95	"
Linguistics (1st Attempt)	54.9%	52	54.8%	54	54.8%	106	60.8%
Linguistics (2nd Attempt)	54.7%	45	52.9%	45	53.8%	90	"
Linguistics (3rd Attempt)	67.3%	42	69.3%	43	68.3%	85	"
*Linguistics (4th Attempt)	59.1%	46	59.0%	49	59.0%	95	"
*Social Work	51.5%	53	50.0%	46	50.8%	99	51.4%
*Clothing & Textiles	43.8%	45	42.0%	57	42.9%	102	42.8%
*Nursing	33.3%	57	33.5%	51	33.4%	108	35.7%
Home Economics (1st Attempt)	37.0%	44	39.3%	44	38.2%	88	24.4%
+Home Economics (2nd Attempt)	30.8%	45	29.8%	45	30.3%	90	"

*Indicates articles adequately represent the literature from which they were selected.

+Indicates articles do not adequately represent the literature from which they were selected but were utilized because they were nearly equally opposite in estimated sex-of-authorship.

literature in law (or home economics) would you estimate are written by men and women?" (Experiment I), they are apt to respond in terms of their perceptions of social reality. However, when asked to "Estimate the probability that the article you have just read was written by a man or a women" (Experiment III), some subjects may think the question is an attempt to measure prejudice. The pressure to "look good" would be strongest on extreme literatures where the inclination to respond heavily toward one sex would be greatest. Of course, another possible explanation is that we just did not sample articles which represented the professional literature of the area.

Fortunately, the problem is not very serious, since the law and home economics articles we used fall short of their targets by approximately equal amounts (5.2% and 5.9%, respectively). Since the goal of the standardization procedure was to derive a set of articles balanced across a range of sex-relatedness, the final law and home economics articles tested above were adequate for this purpose. They merely did not allow us to test as wide a range of stimuli as we would have liked.

The articles extracted by Experiment III produce a reasonably balanced seven-point scale of sex-related articles, which is depicted in Figure 5. It will be noticed that the data of interest are unweighted means obtained by collapsing over sex of subjects. This was thought appropriate because t-tests conducted on each of the seven occupational literatures and each of the seven articles selected revealed no significant differences between the ratings of male and female subjects (see Appendix II). Overall, in fact, the mean of the

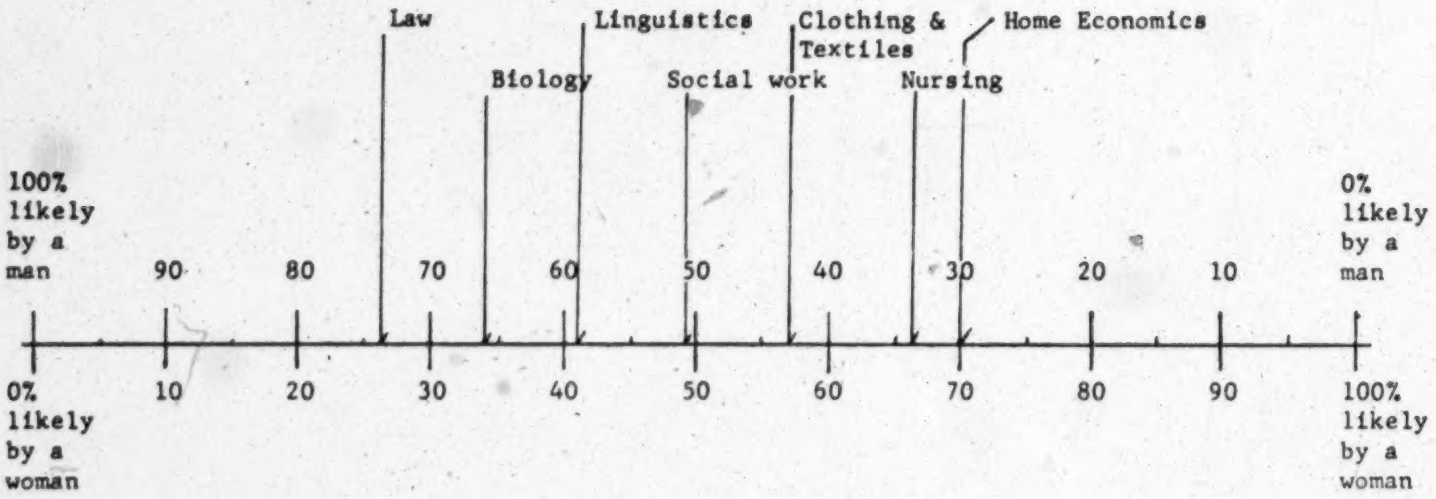


Figure 5. Mean perceived sex of authorship of the seven articles used in the replication of Goldberg's (1968) study.

differences in male and female ratings, of the occupational articles, is only 1.4%.

EXPERIMENT IV

Statement of the Problem

The purpose of the present study was to replicate, using properly sex-balanced stimuli, the Goldberg (1968) study. We also intended to extend the test Goldberg used by studying an ordered array of stimuli, and male as well as female subjects. In addition, we wished to test the heuristic value of the interactive sex of subject by sex-relatedness of task model, in the Goldberg situation.

Hypotheses

Following Goldberg's (1968) hypothesis (but not his findings) it is predicted that there will be a significant article x sex of author interaction. Specifically, subjects will rate male-related articles attributed to male authors higher than male-related articles attributed to female authors. Conversely, female-related articles attributed to female authors will be rated higher than female-related articles attributed to male authors.

It is further hypothesized, in the light of previous research (McDavid and Sistrunk, 1971; Fullerton and Altemeyer, 1974) which showed that in conformity situations either sex will conform more when judging matters deemed to be part of the other sex's cultural sphere, that the predicted article x sex of author interaction would

be the result of higher ratings by female subjects than male on male oriented articles attributed to male authors and higher ratings by male subjects than female subjects on female-related articles attributed to female authors. This trend would be reflected in a significant sex of subject x sex relatedness of article x sex of author interaction.

Method

Ninety-eight male and 98 female introductory psychology students at the University of Manitoba took part in Experiment IV to earn credit toward their grade. None of these subjects had served in Experiments I, II, or III.

The subjects were presented with booklets in which the seven articles, derived in Experiment III, appeared. There were two types of booklets (Form A and Form B) which varied the sex of the author for each article (e.g., Joan T. McKay or John T. McKay). Both forms contained articles attributed to male and female authors and overall for each article half of the sample was told its author was male and the other half was led to believe the author was female. Table 4 shows the sex of author designations for the two forms. It will be noticed that Form A has four articles attributed to male authors and three articles attributed to female authors, while the reverse is true for Form B. This difference in the number of male-female authors on each of the forms was produced, of course, by our seven article scale. The major alternative was to eliminate one article thus truncating the range of articles sampled; this we were unwilling to do.

Forty-nine male and 49 female subjects were randomly assigned

to each of the two forms, thus constituting a 2 x 2 factorial experiment (sex of subject and type of form). To eliminate person to person differences and article position affects from treatment differences each of the four conditions of the experiment included the same 7 x 7 latin square (Winer, 1962). The seven articles were randomly assigned to the latin letters within the 7 x 7 latin square. The positions of the articles within the booklet were assigned to the columns and seven subjects (replicates) were randomly assigned to each of the seven rows. Thus each subject completed all seven articles and each article occurred once in each of the seven possible positions. The observations within each of the 49 cells were summed scores over the seven subjects who received each of the seven different article orderings (see Appendix I).

Within the sex of subject constriction the experimental booklets were randomly distributed to subjects who served in mixed groups of 50-60. As far as was possible, all four experimental conditions were instructed to leave their booklets closed until the experimenter had finished reading aloud the following instructions, adopted from those used by Goldberg (1968):

> "In this booklet you will find excerpts of seven different articles, written by seven different authors in seven different professional fields. At the end of each article you will find several questions that ask for your opinion about various aspects of the article. You are not presumed to be sophisticated or knowledgeable in all the fields. We are interested in the ability of college students to make critical evaluations about articles such as these.
>
> Please read the articles attentively before you give your opinion.
>
> There is enough time to complete all the materials in one hour,

TABLE 4

Author-Sex Designations by Forms and Articles

Occupation Articles	Author-Sex Designation Form A	Author-Sex Designation Form B
Linguistics (1)	Kathy M. Hays	Keith M. Hays
Clothing & Textiles (2)	David S. Johnson	Diane S. Johnson
Law (3)	Brent L. Parker	Betty L. Parker
Social Work (4)	Joan T. McKay	John T. McKay
Home Economics (5)	Gloria P. Walker	George P. Walker
Nursing (6)	Peter F. Greene	Paula F. Greene
Biology (7)	Stanley D. Evans	Shirley D. Evans

but you will have to read at a brisk and steady pace".

When the subjects had finished reading each article they answered a series of seven questions utilizing a five-point scale ranging from +2 (highly favorable) to -2 (highly unfavorable). The subjects rated (a) the author in terms of writing style, professional competence, professional status and ability to sway the reader and (b) the article in terms of thoroughness and learnedness, overall value and significance and persuasiveness (see Appendix III). These ratings constituted the dependent variables in this study.

The subjects worked at their own pace and they were free to leave the experiment when they had completed reading the seven articles and answering the accompanying rating scales. In this manner all the subjects completed this experiment by the end of the allotted hour, a few were finished in 35 minutes; the majority completed it in 45-50 minutes.

Results

Separate univariate analyses of variance were performed on the responses to each of the seven questions which followed every article, as well as on three sum scores (sum over questions 1-3, sum over questions 4-7, sum over questions 1-7). It will be remembered that the sex of author variable, for each of the seven articles, was manipulated between forms and thus the two forms were not balanced in their male-female author composition. Entering forms as a factor in the analysis allowed these differences to be accounted for but this blocking on forms confounded the sex of author factor with the article by form

interaction. In order to determine the effect of the author manipulation and the interactions of (a) sex of author x article and (b) sex of subject x article x sex of author a multiple regression analysis was employed (Draper and Smith, 1966). This procedure facilitated the separation of the effects due to the confounded variables. The significant interactions and main effects of interest were interpreted utilizing orthogonal comparisons (Kirk, 1968).

Table 5 summarizes the significant findings obtained from the ten analyses. It can be seen that reporting the results of the analyses in terms of the sum scores for the article questions (1-3), the author questions (4-7) and for all the questions (1-7) in no way distorts the findings as a whole. For simplicity of exposition, then, the results of this experiment will be described mainly in terms of the overall (1-7) sum score analysis (Table 6). The analysis of variance tables for the remaining nine analyses are given in Appendix I.

Reference to Table 6 will reveal that the simple sex of subject factor was statistically significant ($F = 4.30$, $df = 1/24$, $p = .049$). Comparison of the means indicated that female subjects ($\bar{X}. = 0.61 \pm .04$*) rated the stimuli more favorably overall than male subjects ($\bar{X}. = 0.50 \pm 0.04$). This effect was mainly due to significantly higher ratings given by females on two of the three questions which asked for evaluations of the articles and one of the four questions which asked for evaluations of the author (Table 5).

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*Standard error of the mean.

TABLE 5

Summary of the Significant Effects Obtained in the Ten Analyses

Source	Dependent Measures 1	2	3	4	5	6	7	Σ1-3	Σ4-7	Σ1-7
Forms (F)										
Sex of Subjects (S)		*	*				*	*		*
F x S										
Replicates Within Sex Forms	*	*		*	*	*		*	*	*
Positions (P)				*		*	*		*	*
F x P			*							
S x P										
F x S x P										
Articles (A)	*	*	*	*	*	*	*	*	*	*
A x F	*									
Sex of Author (Au)										
A x AU	*									
A x S		*	*				*	*		*
A x S x F										
S x Au										
S x A x Au										

*$p \leq .05$.

TABLE 6

Analysis of Variance : Sum over All Questions

Source	df	MS	F	p
Forms (F)	1	.0760	-	
Sex of Subject (S)	1	29.8027	4.30	.049
F x S	1	1.3294	-	
Replicates Within Sex Forms Error (1)	24	6.9386	2.12	.004
Positions (P)	6	11.9801	3.67	.002
F x P	6	4.2632	-	
S x P	6	3.4934	1.07	.385
F x S x P	6	2.5077	-	
Articles (A)	6	144.3260	44.19	3.7×10^{-28}
A x F	6	1.9794	-	
Sex of Author (Au)	1	.0312	-	
A x Au	5	2.3691	-	
A x S	6	7.6921	2.36	.035
A x S x F	6	4.6607	1.43	.210
S x Au	1	.0672	-	
S x A x Au	5	5.5794	1.71	.138
Latin Square Error Error (2)	120	3.2660		
TOTAL	195			

The main effect of replicates (groups of individuals receiving the same set of treatments in the same position) within sex and forms was also statistically significant ($F = 2.12$, $df = 24/120$, $p = .004$) indicating that groups of people differed in their ratings of both the article and the author questions (Table 5). The position factor was statistically significant ($F = 3.67$, $df = 6/120$, $p = .002$) indicating that the position of the articles within the booklet affected the subjects' ratings. Again, returning to Table 5 we see that these differences mainly occurred in the ratings of the author questions.

The article factor was also statistically significant ($F = 44.19$, $df = 6/120$, $p = 3.7 \times 10^{-28}$) for both article (1-3) and author (4-7) questions and by far accounted for the greatest proportion of the dependent variables' variance (52%). An orthogonal contrast between the mean ratings of the three female related and three male related stimuli revealed that the articles and the authors of the articles from female occupational areas were rated significantly higher ($\bar{X}. = 0.72 \pm 0.03$ vs. $\bar{X}. = 0.29 \pm 0.03$, respectively); ($F = 112.09$, $df = 1/120$, $p = 1.4 \times 10^{-11}$). This analysis accounted for 42% of the variance attributed to the article main effect.

The sex of author factor was not statistically significant ($F = .01$, $df = 1/120$), indicating that overall, male and female author designations did not influence the subjects' ratings of the stimuli. In addition, neither the hypothesized article x sex of author interaction ($F = .72$, $df = 5/120$) nor the hypothesized sex of subject x article x sex of author triple interaction ($F = 1.71$, $df = 5/120$) reached statistical significance

in either of the three sum score analyses. Table 5 reveals, however, that in the analysis of question 1 there was a significant article by sex of author interaction ($F = 3.18$, $df = 5/120$, $p = .010$).

Returning to the overall (1-7) sum score analysis, Table 6 reveals a significant article x sex of subject interaction ($F = 2.36$, $df = 6/120$, $p = .035$), observable mainly in ratings of the article questions (1-3) Table 5). An orthogonal contrast revealed a significant area (male related articles vs. female related articles) x sex of subject interaction ($F = 8.22$, $df = 1/120$, $p = .005$) which accounted for 58% of the variance attributed to the article x sex of subject interaction. Figure 6 reveals that both male and female subjects rated the female related articles more favorably than the male related articles. Further, the article by sex of subject interaction was a result of male and female subjects rating the female-related articles differently. The male and female subjects rated the male-related articles similarly but females rated the female-related articles considerably higher than the males.

Discussion

The reader will recall that the central purpose of the investigation was to replicate the Goldberg (1968) experiment using a perhaps better standardized and balanced array of sex-related stimuli. In addition, it was hypothesized that the interactive sex of subject x sex relatedness of task model used by Sistrunk and McDavid (1971) to reconcile conflicts in the conformity literature might apply to the "Goldberg" situation as well.

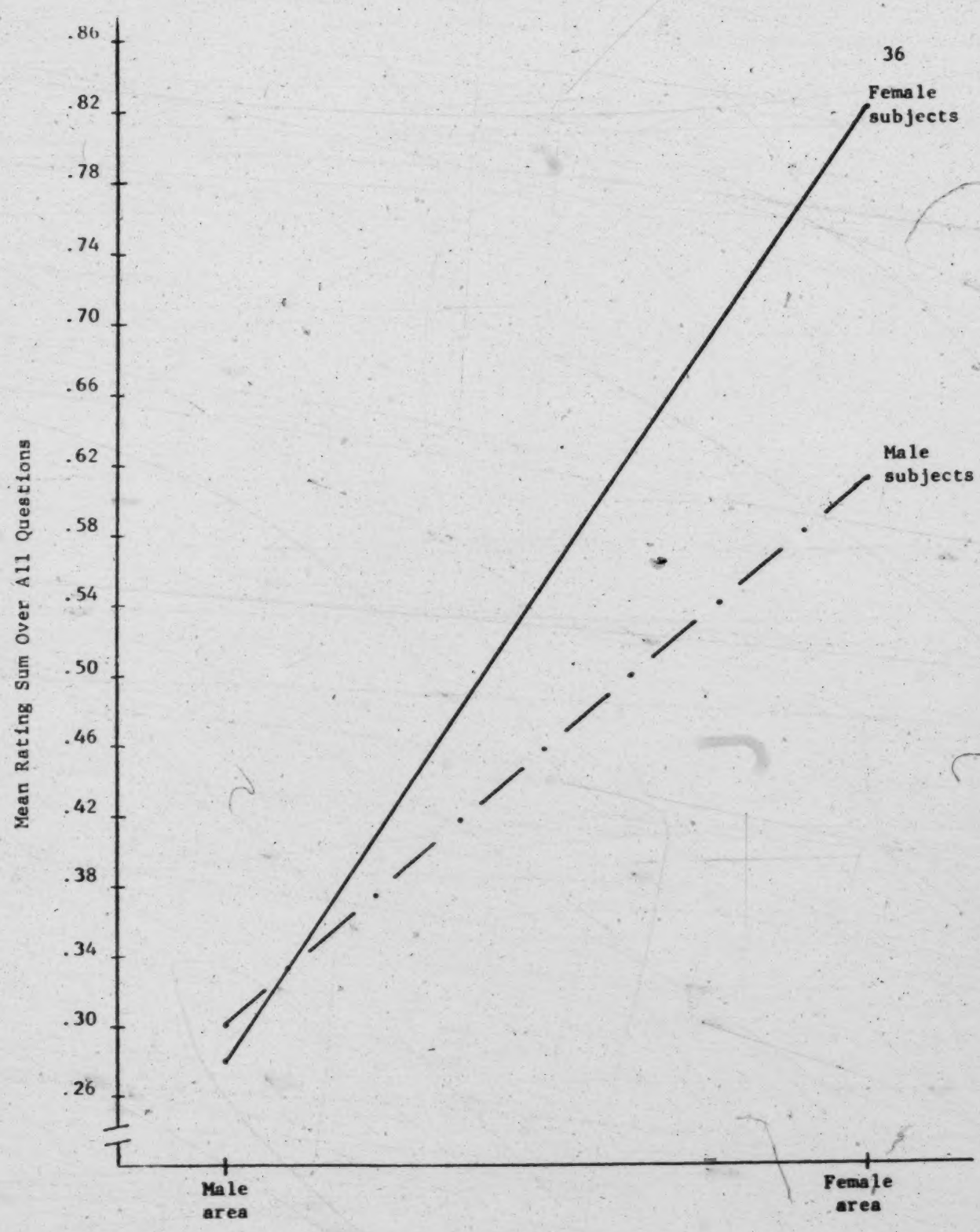

Figure 6. Area x sex of subject interaction.

The nonreplication of Goldberg's results. With regard to the first purpose, the results of this investigation lend no support to Goldberg's assertion that, "Clearly there is a tendency among women to downgrade the work of professionals of their own sex", nor, in fact, was it found that men valued articles or their authors differently as a function of the author's sex.

There are several possible explanations for these findings. It may be that Goldberg's original findings were a chance event and are not generally obtainable. Only one other attempt to replicate Goldberg's (1968) finding with articles has apparently been made. Pheterson (1969) presented professional articles on marriage, child discipline, and special education to a sample of middle-aged women, and found the subjects judged female work to be equal to male work. Although Pheterson later teamed with Kiesler and Goldberg (1971) and found a "Goldberg-effect", in the painting contest study, the effect with articles has apparently not been replicated.

Secondly, since our investigation was conducted several years later than Goldberg's and in a different locale, the sex-of-author manipulation may not have been as effective on our subjects as it might have been for Goldberg's college females.

Thirdly, it may have been that the sex-of-author manipulation was not effective because the subjects failed to perceive the gender manipulation in the author's name (Kathy M. Hays or Keith M. Hays) or they failed to remember the author's sex when they answered the dependent measures. As was the case with Goldberg's study, no specific attention was drawn to the author's name in our instructions. It would appear that

in some instances the Goldberg study was affected, by manipulating the author's sex although the only evidence for assuming this is that the male-related articles received more favorable ratings when attributed to a male author. It is possible that some changes made in Goldberg's method in the present study handicapped what otherwise might have been an effective manipulation. Subjects in this study read seven articles, compared to Goldberg's six and the articles in the present study were approximately 500 words longer. This somewhat heavier work load may have made the subjects work faster and hence pay less attention to the author's sex. It must be said, however, that as was reported above the subjects did not appear to be rushed for time, completing the experimental task in 45-50 minutes. Since no manipulation check to determine if subjects had noticed the author's sex was employed in either the present or in Goldberg's study, it remains an open question whether the sex-of-authorship manipulation was effective.

Assuming that the changes in the subject's work load did not obviate the sex-of-author manipulation it would seem that neither male nor female subjects value the professional work of men more highly than the identical work of women.

The applicability of the Sistrunk and McDavid Model. With regard to our second hypothesis, if we assume that the sex-of-author was noticed but that it had no effect then it would appear that the Sistrunk and McDavid (1971) interactive model has no heuristic value in investigations such as this present one. But if, as we have speculated, the author's sex was not noticed then the predictive value of the Sistrunk and McDavid model in the Goldberg paradigm was inadequately tested and remains unknown.

Other findings. Although the significant article effect was not predicted neither was it unexpected. What was unexpected, and of some interest, was that a large part of this main effect was due to a systematic tendency for the female-related articles to be rated significantly higher than the male-related articles by both male and female subjects. An obvious explanation of these findings would be that the three female-related articles were in fact better written than the three male-related ones. However, it may have been that female-related articles were more practical and the topics they discussed more familiar to our subjects, and this or some other difference may have produced the higher ratings.

A post-hoc reading of the seven articles, used in the present study, lends subjective support to the speculation that the male-related and female-related articles varied on the dimension of familiarity. The topics covered in the male-related articles would appear to be unfamiliar to both male and female subjects while the subject matter discussed in the female-related articles would appear to be familiar to both males and females but probably more familiar to female subjects.

In light of this speculation and the subjective evidence from re-reading the articles perhaps Figure 6 can be interpreted more accurately. That is, there is no difference between the ratings of the male and female subjects on articles which cover topics unfamiliar to both sexes (male area), however, both male and female subjects rate articles which discuss familiar topics (female area) higher than unfamiliar ones (male area). Within the familiar topic area the female subjects rate the articles higher than the male subjects perhaps because the females are more familiar with the topics covered or perhaps some combination of

familiarity and female -relatedness of the topics causes the difference between the ratings of male and female subjects.

To summarize, these speculations point out another dimension, besides sex -relatedness, on which articles used in future studies might be standardized if comparisons of sex-related articles are to avoid ambiguity.

Of course, it is difficult to anticipate ahead of time all the dimensions on which the articles should be standardized and if a difference along some other dimension (e.g., clarity, personal relevance) exists in the population of male- and female-related articles, then perhaps it should not be controlled for.

Summary and Conclusions

The Goldberg (1968) study of female bias against professional women was replicated utilizing a balanced array of sex-related stimuli. Assuming that minor changes in the original procedure did not compromise the present study's ability to test the hypothesis, its results indicate that Goldberg's findings should not be generalized without considerable caution. Goldberg's conclusion that:"

> "Women do consider their own sex inferior. And even when the facts give no support to this belief, they will persist in downgrading the competence - in particular, the intellectual and professional competence - of their fellow females (p. 28)"

cannot be supported with the data in hand.

In addition, this study has shown how research in this area might be better conducted in the future. The findings of significant effects due to the replicates within sex and forms factor as well as the position factor illustrates the necessity of using a design which con-

trols for these effects across treatments and allows the variance they contribute to be extracted from the error term used in testing treatment effects. Also, it does not seem that the sex-of-author manipulation can be assumed a priori to be effective, and a manipulation check should be used to determine its success. Thirdly, further standardization of the articles might be undertaken to assure that other factors (e.g., clarity) which could possibly influence the ratings of the articles do not covary with the male-female relatedness of the articles. If this proves unfeasible then ratings of each article on relevant dimensions could be obtained along with the dependent variables so that an analysis of covariance can be employed to adjust for the effects of these dimensions.

In overview this investigation began with the premise that a previous, widely cited, finding in the literature on sex bias was reliable, but was perhaps also an artifact of several procedural errors. Steps were taken to correct these errors, and it was anticipated that the results obtained might fit a model of sex differences in gender-related judgments produced in another field. Instead, it was found that the initial finding could not be reproduced even though a larger sample, a much improved set of stimuli, and a more powerful statistical test were employed in the present study.

As Rosenthal (1966) has noted, failures to replicate are subject to a variety of interpretations. But if they cannot be attributed to methodological errors, they have at least the effect of questioning the generality of a previous finding. This study was undertaken because the author believed Goldberg's conclusion that, "Women consider their own sex

inferior" was an overstatement. The failure to replicate the findings does not argue otherwise.

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APPENDICES

APPENDIX I

TABLE A

General Form of the 7 x 7 Latin Squares

Replicats	Positions 1	2	3	4	5	6	7
1	Linguistics	Clothing & Textiles	Law	Social Work	Home Economics	Nursing	Biology
2	Biology	Linguistics	Clothing & Textiles	Law	Social Work	Home Economics	Nursing
3	Nursing	Biology	Linguistics	Clothing & Textiles	Law	Social Work	Home Economics
4	Home Economics	Nursing	Biology	Linguistics	Clothing & Textiles	Law	Social Work
5	Social Work	Home Economics	Nursing	Biology	Linguistics	Clothing & Textiles	Law
6	Law	Social Work	Home Economics	Nursing	Biology	Linguistics	Clothing & Textiles
7	Clothing & Textiles	Law	Social Work	Home Economics	Nursing	Biology	Linguistics

APPENDIX I (CONTINUED)

TABLE B1

Raw Data: Question 1

	Form A							Form B						
Male Subjects	-2	+8	+7	+2	+12	+10	+7	+9	+2	+10	+4	+8	+6	+13
	+7	+9	0	+8	+7	+8	+10	+7	+4	+7	+5	+3	+9	+6
	+7	+7	+3	+6	+5	+8	+12	+3	+8	0	-1	+11	+8	+13
	+8	+7	+9	+4	+1	+6	+6	+10	+3	+7	+5	+1	+7	+6
	+7	+12	+3	+9	+4	+2	0	+9	+8	+8	+13	+8	+2	+9
	+3	+6	+12	+5	+13	+7	+3	+7	+8	+13	+7	+13	+10	+1
	+8	+5	+9	+13	+9	+10	+9	+3	+7	+9	+12	+9	+10	+4
Female Subjects	+10	+4	+5	+11	+13	+12	+13	+7	+6	+3	+9	+10	+7	+9
	+8	+7	+5	+5	+9	+13	+11	+10	+7	+5	+8	+8	+12	+9
	+3	+2	+6	+1	0	+7	+10	+8	+10	+7	+1	+8	+6	+13
	+8	+9	+6	+4	+6	+7	+6	+10	+7	+9	+3	+3	+7	+10
	+7	+13	+6	+6	+3	+2	+2	+4	+11	+5	+10	+7	+5	+4
	+1	+9	+10	+8	+5	+2	+4	+5	+1	+13	+6	+10	+10	+2
	+5	+10	+10	+13	+7	+8	+1	+12	+11	+11	+11	+9	+10	+11

NOTE: Values given (X) are Sum Scores over seven subjects; $\bar{X}. = X \div 7$.

APPENDIX I (CONTINUED)

TABLE B2

Mean Ratings by Sex of Subject, Form, Article, and Sex of Author: Question 1

		Law	Biology	Linguis-tics	Social Work	Clothing & Textiles	Nursing	Home Economics
Male Subjects	Form A	.694(M)	1.265(M)	.694(F)	.918(F)	.571(M)	.04 (M)	.571(F)
	Form B	1.143(F)	1.449(F)	.816(M)	.959(M)	.306(F)	.857(F)	1.490(M)
Female Subjects	Form A	.612(M)	1.000(M)	.673(F)	1.204(F)	.551(M)	1.143(M)	1.633(F)
	Form B	.939(F)	1.388(F)	1.06 (M)	1.000(M)	.694(F)	1.041(F)	1.633(M)

Note: The Author-Sex designation is given in parenthesis.

APPENDIX I (CONTINUED)

TABLE B3

Analysis of Variance: Question 1

Source	df	MS	F	P
Forms (F)	1	2.6239	1.24	.277
Sex of Subject (S)	1	1.0525	-	
F x S	1	.8426	-	
Replicates Within Sex & Forms Error (1)	24	2.1222	2.54	5.0×10^{-4}
Positions (P)	6	.4468	-	
F x P	6	8909	1.07	.386
S x P	6	.2004	-	
F x S x P	6	.1878	-	
Articles (A)	6	22.5624	27.04	3.3×10^{-20}
A x F	6	2.3025	2.76	.015
Sex of Author (Au)	1	.4811	-	
A x Au	5	2.6600	3.18	.010
A x S	6	1.0848	1.30	.262
A x S x F	6	.6266	-	
S x Au	1	.2726	-	
S x A x Au	5	.6974	-	
Latin Square Error Error (2)	120	.8346		
Total	195			

APPENDIX I (CONTINUED)

TABLE C1

Raw Data: Question 2

	Form A							Form B						
Male Subjects	-9	+5	+1	+3	+8	+8	+2	-9	0	+3	+4	0	+11	0
	+2	-1	-2	+5	+5	+7	+9	+2	-3	+4	+6	+3	+6	+11
	+7	-2	-4	+2	+3	+8	+1	+5	0	-6	+1	+4	+9	+8
	+1	+7	+1	-2	-2	-7	+6	+6	+7	+2	-7	+2	0	+7
	+2	+1	+8	-5	-6	+5	-2	+6	+3	+10	+4	-1	+1	+3
	+3	+9	+8	+7	+2	+4	+3	+5	+3	+8	+5	0	+1	+1
	+5	-2	+7	+9	+8	+1	+1	-1	-3	+11	+1	+12	-1	-7
Female Subjects	-4	+5	+2	+9	+8	+10	-3	-2	0	+3	+6	+5	+3	+4
	+6	-2	+6	+1	+11	+10	+12	+6	-3	+5	+5	+6	+9	+6
	+5	-2	-1	+2	-2	+9	+6	+7	+3	+1	+3	+1	+8	+13
	+7	+12	+4	-2	+7	+4	+8	+6	+8	+2	-1	+3	0	+9
	+7	+9	+9	+2	-1	+3	+1	+3	+12	+9	0	-8	+4	0
	+3	+10	+7	+12	-3	-8	+3	-1	+4	+7	+8	-1	-7	+4
	+4	0	+7	+11	+11	-1	-9	+6	+3	+9	+6	+14	+1	-3

NOTE: Values given (X) are sum scores over seven subjects; $\bar{X}. = X \div 7$.

APPENDIX I (CONTINUED)

TABLE C2

Mean Ratings by Sex of Subject, Form, Article, and Sex of Author: Question 2

		Law	Biology	Linguis-tics	Social Work	Clothing & Textiles	Nursing	Home Economics
Male Subjects	Form A	.306 (M)	.020 (M)	-.347 (F)	.816 (F)	.326 (M)	1.082 (M)	.714 (F)
	Form B	.367 (F)	.143 (F)	-.653 (M)	.878 (M)	.163 (F)	1.245 (F)	.653 (M)
Female Subjects	Form A	.184 (M)	.061 (M)	-.551 (F)	1.245 (F)	.612 (M)	1.449 (M)	1.184 (F)
	Form B	.224 (F)	.306 (F)	-.469 (M)	.918 (M)	.510 (F)	1.122 (F)	1.184 (M)

Note: The Author-Sex designation is given in parenthesis.

APPENDIX I (CONTINUED)

TABLE C3

Analysis of Variance: Question 2

Source	df	MS	F	P
Forms (F)	1	.4555	-	
Sex of Subject (S)	1	8.9803	5.14	.033
F x S	1	.1232	-	
Replicates Within Sex & Forms Error (1)	24	1.7471	1.75	.026
Positions (P)	6	1.1878	1.19	.315
F x P	6	1.1698	1.17	.325
S x P	6	1.8068	1.81	.102
F x S x P	6	.4157	-	
Articles (A)	6	69.7422	69.97	7.5×10^{-37}
A x F	6	.6732	-	
Sex of Author (Au)	1	.7894	-	
A x Au	5	.6500	-	
A x S	6	2.1600	2.17	.050
A x S x F	6	1.1300	1.13	.347
S x Au	1	.2186	-	
S x A x Au	5	1.3123	1.32	.262
Latin Square Error Error (2)	120	.9967		
Total	195			

APPENDIX I (CONTINUED)

TABLE D1

Raw Data: Question 3

	Form A							Form B						
Male Subjects	-6	+8	0	0	+8	+6	-2	0	-3	+5	+3	+2	+8	+2
	-5	+4	+1	+4	+3	+9	+6	-1	-6	+5	0	+6	+5	+4
	+5	-5	-7	+4	+1	+7	+2	+1	-4	-7	-2	_2	+5	+7
	-3	+2	-3	-3	-1	+1	+2	+2	+2	-3	-6	-1	-3	+8
	0	0	+2	-6	-9	0	-3	+3	+4	+6	-3	-4	+2	+3
	0	+5	+7	-3	-5	+2	+3	+1	0	+7	+5	0	0	-2
	+3	-5	+5	+8	+4	-1	-7	+3	-1	+7	+3	+7	-6	-4
Female Subjects	-4	+3	+1	+6	+5	+12	-4	-3	-1	+2	+7	+6	+1	0
	+2	-2	+6	-2	+9	+8	+9	+1	-1	+5	+3	+3	+7	+5
	0	-4	+1	+1	-3	+9	+9	+5	-4	-4	+3	-3	+3	+10
	+5	+7	-4	-4	+4	+2	+6	+3	+7	-2	-2	+1	-3	+8
	+5	+10	+10	-3	-5	0	-3	+2	+9	+4	+2	-4	+2	-2
	+3	+11	+8	+7	-4	-8	+2	-4	+3	+9	+7	-1	-7	+2
	0	-3	+8	+10	+3	-5	-9	0	-1	+8	+5	+6	-2	-2

NOTE: Values given (X) are sum scores over seven subjects; $\bar{X}. = X \div 7$.

APPENDIX I (CONTINUED)

TABLE D2

Mean Ratings by Sex of Subject, Form, Article, and Sex of Author: Question 3

		Law	Biology	Linguis-tics	Social Work	Clothing & Textiles	Nursing	Home Economics
Male Subjects	Form A	-.041 (M)	-.551 (M)	-.531 (F)	.448 (F)	.367 (M)	.449 (M)	.633 (F)
	Form B	.143 (F)	-.306 (F)	-.551 (M)	.653 (M)	.041 (F)	.673 (F)	.612 (M)
Female Subjects	Form A	-.102 (M)	-.449 (M)	-.633 (F)	1.102 (F)	.326 (M)	980 (M)	1.122 (F)
	Form B	-.163 (F)	-.122 (F)	-.469 (M)	.694 (M)	.245 (F)	714 (F)	1.000 (M)

Note: The Author-Sex designation is given in parenthesis.

APPENDIX I (CONTINUED)

TABLE D3

Analysis of Variance: Question 3

Source	df	MS	F	P
Forms (F)	1	.0029	-	
Sex of Subject (S)	1	8.5014	5.99	.022
F x S	1	1.5423	1.09	.307
Replicates Within Sex & Forms Error (1)	24	1.4181	1.42	.113
Positions (P)	6	1.8520	1.85	.095
F x P	6	2.2631	2.26	.042
S x P	6	1.7072	1.71	.125
F x S x P	6	.9794	-	
Articles (A)	6	60.8826	60.84	4.3×10^{-34}
A x F	6	1.2087	1.21	.307
Sex of Author (Au)	1	.3508	-	
A x Au	5	1.3803	1.38	.237
A x S	6	2.3025	2.30	.039
A x S x F	6	1.3467	1.35	.243
S x Au	1	.1176	-	
S x A x Au	5	1.5925	1.59	.168
Latin Square Error Error (2)	120	1.001		
Total	195			

APPENDIX I (CONTINUED)

TABLE E1

Raw Data: Question 4

	Form A							Form B						
Male Subjects	-9	+11	+3	+2	+11	+5	+1	-8	+5	0	+9	+5	+6	-3
	-4	+1	+4	+3	+3	+6	+3	-2	-1	+3	-1	+6	+4	+4
	-2	-6	-5	+6	+2	+3	-1	+5	-5	+2	+3	+2	+8	+7
	-2	-3	+5	0	+5	0	+5	+5	0	+1	-2	+3	+2	+10
	+2	+6	-2	-1	-6	+4	-7	+6	0	+4	-2	-4	+3	+1
	-3	+5	+8	-3	-3	+7	+7	+1	+9	+10	+1	+4	+4	+3
	+1	-7	+7	+6	+6	+4	+3	+3	-11	+8	+8	+4	-5	-9
Female Subjects	+2	+6	-2	+8	+6	+8	0	+2	+1	-1	+7	+7	+4	+3
	-4	+1	+5	+3	+10	+11	+11	-6	+5	+6	-1	+6	+8	+6
	-4	-7	+4	-2	-4	+6	+9	+1	-7	+1	+2	-4	+9	+9
	+8	+4	-2	+4	+7	+4	+5	+4	0	-4	-1	+2	-2	+6
	+7	0	+9	-1	-3	+2	+2	0	+5	+1	+3	-3	+1	-4
	-7	+9	+10	+5	-6	-7	+4	-9	+2	+8	+2	-4	-9	+6
	+2	-4	+8	+7	+3	-2	-1	+3	-6	+10	+6	+3	-2	+1

NOTE: Values given (X) are sum scores over seven subjects; $\bar{X}. = X \div 7$.

APPENDIX I (CONTINUED)

TABLE E2

Mean Ratings by Sex of Subject, Form, Article, and Sex of Author: Question 4

		Law	Biology	Linguis-tics	Social Work	Clothing & Textiles	Nursing	Home Economics
Male Subjects	Form A	-.184 (M)	- 082 (M)	-.184 (F)	.551 (F)	.776 (M)	.082 (M)	.694 (F)
	Form B	-.122 (F)	-.245 (F)	-.367 (M)	1.143 (M)	.469 (F)	.490 (F)	.796 (M)
Female Subjects	Form A	-.163 (M)	-.449 (M)	.000 (F)	1.082 (F)	.490 (M)	.735 (M)	1.041 (F)
	Form B	-.551 (F)	-.347 (F)	-.082 (M)	.816 (M)	.429 (F)	.347 (F)	.959 (M)

Note: The Author-Sex designation is given in parenthesis.

APPENDIX I (CONTINUED)

TABLE E3

Analysis of Variance: Question 4

Source	df	MS	F	P
Forms (F)	1	.7464	-	
Sex of Subject (S)	1	.4198	-	
F x S	1	4.9009	1.87	.184
Replicates Within Sex & Forms Error (1)	24	2.6152	1.84	.017
Positions (P)	6	8.0739	5.68	3.0×10^{-5}
F x P	6	8.2800	-	
S x P	6	1.6885	1.19	.318
F x S x P	6	.7682	-	
Articles (A)	6	52.6113	37.00	4.1×10^{-25}
A x F	6	.7396	-	
Sex of Author (Au)	1	.9339	-	
A x Au	5	.7007	-	
A x S	6	2.5355	1.78	.108
A x S x F	6	2.7444	1.93	.081
S x Au	1	.3508	-	
S x A x Au	5	3.2231	2.27	.052
Latin Square Error Error (2)	120	1.4220		
Total	195			

APPENDIX I (CONTINUED)

TABLE F1

Raw Data: Question 5

	Form A							Form B						
Male Subjects	+5	+7	+12	+4	+12	+11	+9	+7	-1	+5	+7	+5	+9	+10
	+6	+5	-2	+5	+6	+6	+7	+12	+7	+2	+4	+5	+7	+6
	+6	+9	+5	+4	+7	+8	+5	+5	+8	+6	0	+9	+8	+9
	+3	+2	+7	+3	+2	+3	+5	+8	+3	+9	+9	+1	+4	+7
	+5	+6	+3	+11	+3	-1	+1	+7	+6	+8	+12	+7	+1	+9
	+8	+4	+10	0	+12	+8	+4	+9	+5	+12	+1	+12	+8	+1
	+6	+9	+9	+9	+8	+12	+7	+6	+7	+7	+6	+9	+9	+2
Female Subjects	+9	+2	+8	+10	+10	+10	+13	+5	+6	+7	+7	+9	+8	+10
	+10	+10	+3	+6	+7	+12	+11	+10	+9	+7	+10	+7	+8	+8
	+2	+7	+8	-2	+8	+6	+8	+5	+7	+5	+2	+7	+8	+11
	+11	+6	+9	+6	+8	+6	+3	+7	+6	+9	+8	-1	+8	+7
	+6	+7	+9	+10	+5	+3	+4	+5	+10	+8	+11	+6	+2	+5
	+3	+9	+5	+8	+4	+4	0	+7	-1	+10	+7	+10	+10	+2
	+8	+6	+11	+8	+8	+10	+6	+7	+9	+10	+11	+8	+11	+11

NOTE: Values given (X) are sum scores over seven subjects; $\bar{X}. = X \div 7$.

APPENDIX I (CONTINUED)

TABLE F2

Mean Ratings by Sex of Subject, Form, Article, and Sex of Author: Question 5

	For	Law	Biology	Linguis-tics	Social Work	Clothing & Textiles	Nursing	Home Economics
Male Subjects	Form A	.918 (M)	1 347 (M)	.735 (F)	.837 (F)	408 (M)	.755 (M)	1.041 (F)
	Form B	959 (F)	1.469 (F)	.939 (M)	939 (M)	.204 (F)	.837 (F)	1.082 (M)
Female Subjects	Form A	.837 (M)	1.286 (M)	.980 (F)	1.061 (F)	.449 (M)	1.102 (M)	1.245 (F)
	Form B	1.082 (F)	1.388 (F)	1.102 (M)	.878 (M)	.510 (F)	1.020 (F)	1.347 (M)

Note: Author-Sex designation is given in parenthesis.

APPENDIX I (CONTINUED)

TABLE F3

Analysis of Variance: Question 5

Source	df	MS	F	P
Forms (F)	1	.9979	-	
Sex of Subject (S)	1	5.7734	2.70	.113
F x S	1	.0006	-	
Replicates Within Sex & Forms Error (1)	24	2.1363	2.66	3.0×10^{-4}
Positions (P)	6	.7172	-	
F x P	6	.4383	-	
S x P	6	.4893	-	
F x S x P	6	.3834	-	
Articles (A)	6	17.7036	22.06	2.2×10^{-17}
A x F	6	.4179	-	
Sex of Author (Au)	1	.0294	-	
A x Au	5	.4956	-	
A x S	6	.7478	-	
A x S x F	6	.4718	-	
S x Au	1	.6321	-	
S x A x Au	5	.4398	-	
Latin Square Error Error (2)	120	.8026		
Total	195			

APPENDIX I (CONTINUED)

TABLE G1

Raw Data: Question 6

	Form A							Form B						
Male Subjects	+6	+6	+7	+2	+10	+7	+9	+2	-1	+7	+3	+4	+7	+6
	+3	+5	-2	+5	+6	+6	+9	+8	+5	+2	+6	+3	+4	+7
	+4	+8	+5	+4	+5	+9	+3	+4	+4	+6	0	+7	+3	+5
	+2	+1	+7	+5	+1	+3	+4	+3	+2	+6	+9	+1	+6	+5
	+3	-1	-3	+9	+2	-2	+4	+4	+6	+10	+8	+10	0	+10
	+6	+3	+6	+3	+9	+5	+1	+6	+3	+10	+3	+10	+6	+1
	+2	+10	+8	+8	+8	+12	+8	+3	+6	+4	+2	+8	+7	+1
Female Subjects	+7	0	+8	+7	+6	+9	+10	+8	+6	+7	+7	+7	+5	+8
	+8	+6	+1	+4	+3	+7	+9	+7	+7	+3	+10	+5	+6	+6
	+4	+6	+5	-3	+5	+6	+4	+6	+6	+5	-2	+6	+7	+8
	+3	+4	+7	+4	+4	+7	+3	+5	+5	+9	+10	0	+8	+5
	+5	+1	+9	+10	+5	0	+5	+4	+7	+8	+11	+6	+2	+5
	+3	+6	+6	+7	+7	+4	+1	+4	+3	+9	+5	+6	+6	0
	-1	+6	+8	+7	+6	+10	+3	+2	+5	+7	+7	+7	+7	+5

NOTE: Values given (X) are sum scores over seven subjects: $\bar{X}. = X \div 7$.

APPENDIX I (CONTINUED)

TABLE G2

Mean Ratings by Sex of Subject, Form, Article, and Sex of Author: Question 6

		Law	Biology	Linguis-tics	Social Work	Clothing & Textiles	Nursing	Home Economics
Male Subjects	Form A	.816 (M)	1.163 (M)	.735 (F)	.714 (F)	.204 (M)	.714 (M)	.694 (F)
	Form B	980 (F)	1.000 (F)	.796 (M)	.510 (M)	.122 (F)	.837 (F)	.694 (M)
Female Subjects	Form A	.776 (M)	1.184 (M)	.694 (F)	.776 (F)	.041 (M)	.980 (M)	694 (F)
	Form B	.918 (F)	1.102 (F)	.959 (M)	653 (M)	.224 (F)	.857 (F)	1.000 (M)

Note: The Author-Sex designation is given in parenthesis.

APPENDIX I (CONTINUED)

TABLE G3

Analysis of Variance: Question 6

Source	df	MS	F	P
Forms (F)	1	.3856	-	
Sex of Subject (S)	1	1.3477	-	
F x S	1	2.5270	1.61	.217
Replicates Within Sex & Forms Error (1)	24	1.5707	2.64	3.0×10^{-4}
Positions (P)	6	1.9106	3.21	.006
F x P	6	.3567	-	
S x P	6	.4616	-	
F x S x P	6	.0201	-	
Articles (A)	6	17.2439	28.97	3.1×10^{-21}
A x F	6	.8975	1.51	.181
Sex of Author (Au)	1	.0787	-	
A x Au	5	1.0612	1.78	.121
A x S	6	.3086	-	
A x S x F	6	.5232	-	
S x Au	1	.6569	1.10	.296
S x A x Au	5	.4965	-	
Latin Square Error Error (2)	120	.5952		
Total	195			

APPENDIX I (CONTINUED)

TABLE H1

Raw Data: Question 7

	Form A							Form B						
Male Subjects	-5	+5	+2	+1	+5	+4	-2	-4	0	0	+5	+4	+7	0
	-8	-2	-1	+1	+1	+8	+7	-3	-4	+2	-3	+2	+5	+4
	+2	-7	-4	+5	+6	+6	+3	-1	-3	-4	-2	0	0	+1
	-4	-2	-1	-2	-4	+1	+4	+2	0	-6	-3	-1	+2	+5
	-1	+1	+3	-4	-9	0	-2	+4	+3	+3	-5	-7	-1	+4
	+1	-2	+8	-7	-7	+2	+4	+1	-1	+8	+6	+1	-6	-3
	-2	-3	+5	+5	+2	-1	-5	+3	-2	+6	+1	+7	-6	-6
Female Subjects	-3	+1	+1	+9	+5	+7	-4	-6	-1	0	+6	+5	+1	+1
	-5	-3	+7	+2	+8	+10	+10	-4	-3	+5	0	+5	+10	+5
	0	-7	+2	-1	+1	+8	+8	+3	-7	-3	+1	-3	+5	+10
	+2	+4	-4	-4	+4	0	+5	+3	+4	-5	-4	+2	-2	+9
	+4	+6	+7	-3	-4	+1	-1	+3	+9	+3	-2	-8	+1	-2
	+2	+8	+7	+7	-3	-4	+2	-4	+3	+10	+8	-5	-8	+2
	+3	-3	+6	+7	+3	-4	-10	-1	-2	+9	+5	+4	-4	-2

NOTE: Values given (X) are sum scores over seven subjects; X. = $\bar{X} \div 7$

APPENDIX I (CONTINUED)

TABLE H2

Mean Ratings by Sex of Subject, Form, Article, and Sex of Author: Question 7

		Law	Biology	Linguis-tics	Social Work	Clothing & Textiles	Nursing	Home Economics
Male Subjects	Form A	.122 (M)	- 612 (M)	-.510 (F)	.286 (F)	143 (M)	.184 (M)	.531 (F)
	Form B	.041 (F)	-.449 (F)	-.694 (M)	.429 (M)	-.041 (F)	.531 (F)	.490 (M)
Female Subjects	Form A	041 (M)	-.612 (M)	-.531 (F)	.980 (F)	.347 (M)	.776 (M)	.918 (F)
	Form B	-.265 (F)	-.531 (F)	-.694 (M)	.816 (M)	.184 (F)	.571 (F)	1.06 (M)

Note: The Author-Sex designation is given in parenthesis.

APPENDIX I (CONTINUED)

TABLE H3

Analysis of Variance: Question 7

Source	df	MS	F	P
Forms (F)	1	.6560	-	
Sex of Subject (S)	1	11.9417	10.73	.003
F x S	1	1.5423	1.39	.251
Replicates Within Sex & Forms Error (1)	24	1.1127	1.17	.284
Positions (P)	6	4.7004	4.94	2.0×10^{-4}
F x P	6	1.1237	1.18	.321
S x P	6	.5964	-	
F x S x P	6	1.2957	1.36	.236
Articles (A)	6	59.1052	62.10	1.7×10^{-34}
A x F	6	.8754	-	
Sex of Author (Au)	1	.0001	-	
A x Au	5	1.0504	1.10	.362
A x S	6	3.7903	3.98	.001
A x S x F	6	.7412	-	
S x Au	1	.6444	-	
S x A x Au	5	.7606	-	
Latin Square Error Error (2)	120	.9518		
Total	195			

APPENDIX I (CONTINUED)

TABLE I1

Raw Data: Sum over Article Questions

	Form A							Form B						
Male Subjects	-17	+21	+8	+6	+28	+23	+7	0	-1	+18	+11	+10	+25	+15
	+6	+12	-1	+17	+14	+24	+25	+10	-5	+16	+11	+12	+20	+20
	+19	0	-8	+12	+9	+23	+15	+9	+4	-13	-2	+17	+22	+28
	+6	+16	+7	-1	-2	+15	+14	+18	+12	+6	-8	+2	+4	+21
	+9	+13	+14	-2	-11	+ 7	-5	+18	+15	+24	+14	+3	+5	+15
	+6	+20	+27	+9	+10	+13	+9	+13	+13	+29	+17	+13	+11	0
	+16	-2	+21	+30	+21	+10	+3	+5	+3	+27	+16	+28	+3	-7
Female Subjects	+2	+12	+9	+26	+26	+34	+6	+2	+5	+8	+22	+21	+11	+13
	+18	+3	+17	+4	+29	+31	+32	+17	+3	+15	+16	+17	+28	+20
	+8	-4	+6	+4	-5	+25	+25	+19	+9	+4	+7	+6	+17	+36
	+20	+28	+6	-2	+17	+13	+20	+19	+22	+9	0	+7	+4	+27
	+19	+32	+25	+5	-3	+5	0	+9	+32	+18	+12	-6	+11	+2
	+7	+30	+25	+27	-2	-14	+9	0	+8	+29	+21	+8	-4	+8
	+9	+7	+25	+34	+21	+2	-17	+18	+13	+28	+22	+29	+9	+6

NOTE: Values given (X) are sum scores over seven subjects and three questions; $\bar{X}. = X \div (7 \times 3)$

TABLE I2

Mean Ratings by Sex of Subject, Form, Article, and Sex of Author: Sum over Article Questions

		Law	Biology	Linguis-tics	Social Work	Clothing & Textiles	Nursing	Home Economics
Male Subjects	Form A	.327 (M)	.259 (M)	-.061 (F)	.721 (F)	.422 (M)	.864 (M)	.973 (F)
	Form B	.551 (F)	.442 (F)	-.129 (M)	.844 (M)	.170 (F)	.918 (F)	.925 (M)
Female Subjects	Form A	.238 (M)	.211 (M)	-.170 (F)	1.184 (F)	.497 (M)	1.190 (M)	1.313 (F)
	Form B	.333 (F)	.524 (F)	.034 (M)	.871 (M)	.483 (F)	.952 (F)	1.272 (M)

Note: The Author-Sex designation is given in parenthesis.

APPENDIX I (CONTINUED)

TABLE I3

Analysis of Variance: Sum Over Article Questions

Source	df	MS	F	P
Forms (F)	1	.2646	-	
Sex of Subject (S)	1	15.3064	4.54	.044
F x S	1	.2335	-	
Replicates Within Sex & Forms Error (1)	24	3.3704	1.79	.022
Positions (P)	6	2.5202	1.34	.245
F x P	6	3.1552	1.67	.133
S x P	6	2.4781	1.32	.256
F x S x P	6	.9789	-	
Articles (A)	6	110.5401	58.66	2.2×10^{-33}
A x F	6	3.1138	1.65	.139
Sex of Author (Au)	1	1.2252	-	
A x Au	5	3.4915	1.85	.108
A x S	6	4.1261	2.19	.049
A x S x F	6	2.6518	1.41	.217
S x Au	1	.0936	-	
S x A x Au	5	3.1635	1.68	.145
Latin Square Error Error (2)	120	1.8844		
Total	195			

APPENDIX I (CONTINUED)

TABLE J1

Raw Data: Sum over Author Questions

	Form A							Form B						
Male Subjects	-3	+29	+24	+9	+38	+29	+17	0	+3	+12	+24	+18	+29	+13
	-3	+9	-1	+14	+16	+26	+26	+15	+7	+9	+6	+16	+20	+21
	+10	+4	+1	+19	+20	+26	+10	+13	+4	+10	+1	+18	+19	+22
	+2	+2	+18	+6	+4	+7	+18	+18	+5	+10	+13	+4	+14	+27
	+9	+12	+7	+15	+10	0	-4	+21	+15	+25	+13	+6	+3	+24
	+12	+10	+32	-7	+11	+22	+16	+17	+16	+40	+9	+27	+12	+2
	+7	+9	+29	+28	+26	+27	+13	+15	0	+25	+17	+28	+5	-12
Female Subjects	+15	+9	+15	+34	+27	+32	+19	+10	+12	+12	+28	+28	+17	+22
	+8	+14	+16	+15	+26	+40	+41	+7	+20	+21	+19	+23	+32	+25
	+2	-1	+19	-8	+10	+26	+29	+15	-1	+8	+3	+6	+30	+38
	+24	+18	+10	+10	+23	+17	+16	+19	+15	+9	+13	+3	+14	+27
	+22	+14	+34	+16	+3	+6	+10	+12	+31	+21	+23	+1	+6	+4
	+1	+32	+28	+27	+2	+5	+7	-2	+1	+37	+22	+7	-1	+10
	+12	+5	+33	+29	+20	+14	-2	+11	+8	+36	+29	+22	+12	+15

NOTE: Values given (X) are sum scores over seven subjects and four questions; $\bar{X}. = X \div (7 \times 4)$

APPENDIX I (CONTINUED)

TABLE J2

Mean Ratings by Sex of Subject, Form, Article, and Sex of Author: Sum over Author Questions

		Law	Biology	Linguis-tics	Social Work	Clothing & Textiles	Nursing	Home Economics
Male Subjects	Form A	.418 (M)	.454 (M)	.194 (F)	.597 (F)	.378 (M)	.474 (M)	.755 (F)
	Form B	.464 (F)	.444 (F)	.184 (M)	.755 (M)	.189 (F)	.663 (F)	.765 (M)
Female Subjects	Form A	.372 (M)	.347 (M)	.327 (F)	.964 (F)	.332 (M)	.888 (M)	.974 (F)
	Form B	.311 (F)	.403 (F)	.337 (M)	.801 (M)	.337 (F)	.699 (F)	1.09 (M)

Note: The Author-Sex designation is given in parenthesis.

APPENDIX I (CONTINUED)

TABLE J3

Analysis of Variance: Sum Over Author Questions

Source	df	MS	F	P
Forms (F)	1	.0065	-	
Sex of Subject (S)	1	14.6968	3.41	.077
F x S	1	1.2252	-	
Replicates Within Sex & Forms Error (1)	24	4.3042	1.95	.010
Positions (P)	6	10.9318	4.95	1.0×10^{-4}
F x P	6	1.8628	-	
S x P	6	1.8941	-	
F x S x P	6	1.7286	-	
Articles (A)	6	48.9046	22.14	2.0×10^{-17}
A x F	6	.4266	-	
Sex of Author (Au)	1	.5253	-	
A x Au	5	.4069	-	
A x S	6	4.2792	1.94	.080
A x S x F	6	2.3374	1.06	.392
S x Au	1	.0061	-	
S x A x Au	5	2.8037	1.27	.282
Latin Square Error Error (2)	120	2.2092		
Total	195			

APPENDIX I (CONTINUED)

TABLE K1

Raw Data: Sum over All Questions

	Form A							Form B						
Male Subjects	-20	+50	+32	+14	+66	+52	+24	0	+2	+30	+35	+28	+54	+28
	+3	+21	-2	+31	+30	+50	+51	+25	+2	+25	+17	+28	+40	+41
	+29	+4	-7	+31	+29	+49	+25	+22	+8	-3	-1	+35	+41	+50
	+8	+18	+25	+5	+2	+22	+32	+36	+17	+16	+5	+6	+18	+48
	+18	+25	+21	+13	-21	+7	-9	+39	+30	+49	+27	+9	+8	+39
	+18	+30	+59	+2	+21	+35	+25	+30	+29	+69	+26	+40	+23	+2
	+23	+7	+50	+58	+47	+37	+16	+20	+3	+52	+33	+56	+8	-19
Female Subjects	+17	+21	+24	+60	+53	+66	+25	+12	+17	+20	+50	+49	+28	+35
	+26	+17	+33	+19	+55	+71	+73	+24	+23	+36	+35	+40	+60	+45
	+10	-5	+25	-4	+5	+51	+54	+34	+8	+12	+10	+12	+47	+74
	+44	+46	+16	+8	+40	+30	+36	+38	+37	+18	+13	+10	+18	+54
	+41	+46	+59	+21	0	+11	+10	+21	+63	+39	+35	-5	+17	+6
	+8	+62	+53	+54	0	-9	+16	-2	+9	+66	+43	+15	-5	+18
	+21	+12	+58	+63	+41	+16	-19	+29	+21	+64	+51	+51	+21	+21

Values given (X) are sum scores over seven subjects and seven questions; $\bar{X}_{..} = X \div (7 \times 7)$

APPENDIX I (CONTINUED)

TABLE K2

Mean Ratings by Sex of Subject, Form, Article, and Sex of Author: Sum over All Questions

		Law	Biology	Linguis-tics	Social Work	Clothing & Textiles	Nursing	Home Economics
Male Subjects	Form A	.379 (M)	.370 (M)	.085 (F)	.650 (F)	.397 (M)	.641 (M)	.848 (F)
	Form B	.501 (F)	.443 (F)	.050 (M)	.793 (M)	.181 (F)	.773 (F)	.834 (M)
Female Subjects	Form A	.315 (M)	.289 (M)	.114 (F)	1.058 (F)	.402 (M)	1.017 (M)	1.120 (F)
	Form B	.321 (F)	.455 (F)	.207 (M)	.831 (M)	.399 (F)	.808 (F)	1.169 (M)

Note: The Author-Sex designation is given in parenthesis.

APPENDIX I (CONTINUED)

TABLE K3

Analysis of Variance: Sum Over All Questions

Source	df	MS	F	P
Forms (F)	1	.0760	-	
Sex of Subject (S)	1	29.8027	4.30	[illegible]
F x S	1	1.3294	-	
Replicates Within Sex & Forms Error (1)	24	6.9386	2.12	.004
Positions (P)	6	11.9801	3.67	.002
F x P	6	4.2632	-	
S x P	6	3.4934	1.07	.385
F x S x P	6	2.5077	-	
Articles (A)	6	144.3260	44.19	3.7×10^{-28}
A x F	6	1.9794	-	
Sex of Author (Au)	1	.0312	-	
A x Au	5	2.3691	-	
A x S	6	7.6921	2.36	.035
A x S x F	6	4.6607	1.43	.210
S x Au	1	.0672	-	
S x A x Au	5	5.5794	1.71	.138
Latin Square Error Error (2)	120	3.2660		
Total	195			

APPENDIX II

TABLE A

T-Tests Between the Occupational Area Ratings of Male and Female Subjects

Occupational Areas	Male Subjects	Female Subjects	t	p- two tailed
Law	80.3%(74)	77.2%(72)	1.627	.106
Biology	69.9%(70)	65.6%(62)	1.899	.060
Linguistics	61.8%(65)	59.7%(75)	.794	.429
Social Work	53.2%(71)	49.5%(77)	1.706	.090
Clothing and Textiles	44.3%(70)	41.4%(77)	1.043	.300
Nursing	35.6%(70)	35.8%(77)	.089	.929
Home Economics	25.6%(70)	23.3%(64)	1.008	.315
Collapsed over Occupational Areas	53.1%(490)	50.3%(504)	1.930	.054

NOTE: All percentages are percent male-related. The number of subjects in each group is given in parentheses.

APPENDIX II (CONTINUED)

TABLE B

T-Tests Between the Article Ratings of Male and Female Subjects

Occupational Articles	Male Subjects	Female Subjects	t	p- two-tailed
Law	75.5%(41)	71.6%(53)	1.214	.228
Biology	67.1%(45)	65.8%(50)	.449	.654
Linguistics	59.4%(46)	59.0%(49)	.052	.959
Social Work	51.5%(53)	50.0%(46)	.442	.659
Clothing and Textiles	43.8%(45)	42.0%(57)	.472	.638
Nursing	33.3%(57)	33.5%(51)	.045	.964
Home Economics	30.8%(45)	29.8%(45)	.292	.771
Collapsed over Occupational Articles	50.7%(332)	50.5%(351)	.102	.919

NOTE: All percentages are given as percent likely written by a man. The number of subjects in each group is given in parentheses.

APPENDIX III

Rating Scale and Dependent Measures

Would you please give your opinion to the questions below in terms of the following scale:

+2 = highly favorable
+1 = somewhat favorable
0 = average
-1 = somewhat unfavorable
-2 = highly unfavorable

Indicate your reactions in the blank to the left of each statement.

I. About the article

_____1. How would you rate this article in terms of its thoroughness and learnedness?

_____2. How would you rate this article in terms of its overall value and significance?

_____3. How would you rate this article in terms of its persuasiveness?

II. About the Author of the article

_____1. How would you rate the author in terms of writing style?

_____2. How would you rate the author in terms of professional competence?

_____3. How would you rate the author in terms of professional status?

_____4. How would you rate the author in terms of ability to sway the reader?

NOTE: In the body of the paper and in Appendix I the questions are referred to as questions 1, 2, 3, 4, 5, 6, 7. Under this system the author questions 1, 2, 3, 4 above become 4, 5, 6, 7, respectively.

APPENDIX IV

Instructions and Experimental Articles

In this booklet you will find excerpts of seven articles, written by seven different authors in seven different professional fields. At the end of each article you will find several questions that ask for your opinion about various aspects of the article. You are not presumed to be sophisticated or knowledgeable in all the fields. We are interested in the ability of college students to make critical evaluations about articles such as these.

Please read the articles attentively before you give your opinion.

There is enough time to complete all the materials in one hour, but you will have to read at a brisk and steady pace.

INITIAL POINTS VERSUS INITIAL SEGMENTS OF LINGUISTIC TRAJECTORIES

It is a truism of the classic approach to linguistic reconstruction that the oldest forms on record are ideally suitable for comparative purposes. If we use the metaphor of diachronic trajectories, then it is ordinarily the initial points of such lines that actually matter in historical research. Typologically, one may legitimately contrast modern French with, say, contemporary Spanish or Italian; but in diachronic operations aimed at piecing together the parent language - in this instance, the late provincial varieties of spoken Latin - everybody prefers to have recourse to the oldest available deposits of these three and of other Romance languages. Indo-Europeanists and Semitologists evince a similar set of preferences, too familiar to require exemplification. Let us, then, concentrate on exceptions to this dominant trend of thought and organize them in the order of decreasing banality. Does it happen that initial points of linguistic trajectories fail to yield the best possible clues?

By way of preliminary remark, let us remind ourselves that, in speaking of "oldest" or "most archaic" records, we distinguish between anteriority along the line of absolute chronology and anteriority in terms of intrinsically less advanced evolutionary stage. The two labels may, but need not, coincide. The initial point of a line relatively unpromising, on account of a rapid rate of attrition and the consequent obliteration of valuable traces, may reveal less than do shreds of information extracted from the mid-segment of some other line symbolizing a markedly slower progress.

In the core of our argument, we discriminate between the evolutionary curve of a given language and the gradual refinement (or else crudescence) of its graphic representation. Thus, if the alphabet has been adopted from some other culture, the earliest records may be uncouth to the point of ambiguity, hence, with regard to important features, far less helpful than those of a subsequent period which, for the first time, show a neat correspondence between letter and sound. To the extent that this is true, mere chronological anteriority, not calibrated by the degree of dependability, tends to lose in importance.

A single example should suffice. At the embryonic stage of Romance vernacular literatures, the scribes had at their disposal an alphabet bequeathed by Latin and inapt for the notation of supervenient categories of sounds, such as palatal consonants and new diphthongs, eminently characteristic of early Romance speech. The result of this inadequacy was that the oldest records, expected to reflect the earliest observable phase of Romance, in important respects were basically faulty. One detects two families of errors: the clumsy scribes either aimed at realism, crudely marking the forms they heard - so far as we can piece together the course of events - writing down,

e.g., only one component of a diphthong or leaving palatalization altogether unmarked; or they resorted to Latinized spelling, an attitude which presupposes a measure of etymological deftness, and so suggested learned doublets where none existed in actual usuage or before any, in fact, arose. Thus, the introductory lines of the Reyes Magos, a primitive play of the early 12th century probably from New Castile preserved in a unique MS, contain forms like, on the one hand, quin = "quien" ("who"), timpo = "tiempo" ("time"), cudo = "cuido" or "cuedo" ("I think"), fure = "fuere" ("may be"), escarno = "escarnio" ("mockery"), strela = "(e)strella" ("star"), and, on the other, nocte = "noche" ("night") and december = "diciembre" (in startling rhyme with fembra "woman"). Only as we hit the layer of Alfonsine texts, at a remove of, presumably, a century and a quarter, can we trust the average copyist to keep apart monophthong and diphthong, I and II, voiced z and voiceless ç. Similar remarks could be made on the Oaths of Strasbourg.

More noteworthy are situations involving language development pure and simple, without any regard for graphemics. As a rule, we symbolize, in our thoughts and our charts, such situations as progress, descent, and transmission by straight lines, with the implicit understanding that we toy with a calculated oversimplification, that curved or zig-zagging lines would, strictly speaking, do greater justice to reality, on account of ever-present fluctuations like those that dialect geography has brought out in most dramatic fashion. In cutting out loops and corners, we argue, first, that minor departures from the straight lines are seldom, if ever, clearly discernible over major distances in time; and, second, that, in all likelihood, they balanced one another and thus leveled off.

Suppose now that, through an odd twist of circumstances, the curtain of firm historical tradition rises at the very moment when the oscillation is at its liveliest, as when the needle of the seismograph marks the sharpest deflection from the straight line connecting later stages - the same straight line which we incline to extrapolate also for the earlier, above all the immediately preceding stages, for the most part shielded from direct observation. Clearly, under such circumstances the examination of the initial points alone might lead to confusion. A generously carved-out initial segment, extending preferably over several centuries, is needed to help us discriminate between the principal line of advance and some temporary disturbance eventually overcome and conspicuous mainly because, through the caprice of our fragmentary records, the distortion it was causing coincided with the earliest tangible traces of a given development.

One concrete example, recently elucidated, may yield an illustration of this theoretically envisioned state of affairs. The Classical Latin imperfect, a tense, you recall, involving a fair degree of regularity, was characterized in all major conjugation classes by the segment -ba- attached to the root morpheme by the respective thematic vowel, e.g. laud-a-ba-m "I praised", hab-ē-ba-m "I had", curr-ē-ba-m "I ran", fac-iē-ba-m "I made", aud-i-ba-m (beside aud-iē-ba-m) "I heard"; its six personal endings, except for the 1st sg., matched those of the

pres. subj., and its accentual pattern, but for the absence of rhizotonic forms, resembled the schema of those tenses, insofar as in the 1st and the 2d pl. the stress hit a vowel other than that accented in the remainder of the paradigm.

Now there occurred, for reasons not yet fully clarified, an inferrable substitution of *-iam for class, -ēbam, -iēbam, and -ēbam in provincial spoken Latin, so that one may reckon, in most regional varieties, with (say) *habia for "I had", *facia for "I made", and *audia for "I heard", while full-bodied -āba, as in laud-ā-ba-(m), remained intact. In the Luso-Hispanic subarea of this larger territory, there further took place a minor shift, independent, it would seem, of the loss of -b- since it likewise affected the paradigm of laud-āba-m: the accent of the 1st and the 2d pl. was withdrawn, a change making a single syllable, marked either by a or by i, the consistent carrier of the stress in all six forms: contrast OSp. loáva "I praised", loávamos "we praised" with Tusc. lodá-va or -vo, lodavámo. No further assumptions are required to justify historically the paradigms of the imperfect in Portuguese, Catalan, Provençal, and still other vernaculars.

The great exception to this apparent harmony is Old Spanish. I advisedly emphasize the qualifer "Old", because Classical and Modern Spanish, viewed in isolation, beautifully fit the description of the broad trend. Indeed, were it not for the abundance of unequivocal passages in medieval texts and for a few modern bits of corroborative dialectal evidence, we could never have reconstructed the medieval stage, simply because, counter to expectations, it fails to represent, in terms of actual products, any midpoint between late Antiquity and the premodern or modern stage. In other words, no straight evolutionary line may here be drawn, because, as microscopic inspection confirms, the early records which puzzled a whole generation of ingenious linguists simply reflect no such line, but a protracted temporary deviation from the main course of events.

Among the erratic Old Spanish forms with -ié instead of -ia that may be, on statistical grounds, declared dominant, five entrenched themselves in the paradigm of a verb typical of the -er and -ir classes; thus, from aver "to have" neatly edited 13th- or 14th-century texts allow us to slice off: av-ía "I had", av-íes "thou hadst", a-vié "he had" and, in the plural, correspondingly, av-iémos, av-iédes, av-ién. A fact incidentally discovered half a century ago but never, until 1959, capitalized upon is that the degree of predominance of aberrant -ié over predictable -ia was unequal for Forms 2-6: it reached its maximum, i.e., an absolute measure of prevalence, in the 1st and the 2d pl., while the 2d and 3d sg. plus the 3d pl. displayed only a relative measure of preëminence, in the neighborhood of 80%-90%. In the 1st sg., even at the crest of this movement, the -ié forms consistently represented a minority. Now it can be shown, first, that preterite and imperfect were syntactically closer to each other, hence, one gathers, more intimately associable, in Medieval than in Modern Spanish; second, that in the ranks of the Old Spanish preterite and nowhere else, there spread, shortly before the dawn of vernacular literature, a plural paradigm in -iemos, -iestes, -ieron tending, for a while, to dislodge traditional -imos, -istes, -ieron;

and third, that (as two American pioneers, Ford and Lang, had conjectured) the contact between the new, highly contagious com-iemos "we ate" [once] and comíamos "we were eating" and have sparked the infiltration of ie into most the remainder of the imperfect as the shift iá - ié was at that juncture sporadically observable even outside the verbal paradigm, cf. the well-known proper name Didacu - Diago - Diego.

The reason for the diphthong, ié's failure to dislodge -ia from its last stronghold in the 1st sg. was the chance here afforded to speakers of a Romance language to differentiate between the 1st and the 3d sg. in an important sector of the verbal paradigm - a chance, independent sources confirm, definitely welcome to speakers, both as an escape from bothersome homonymy and as a token of compliance with the total conjugational pattern. The main reason why the 13th-century schema yo avía, tu avíes, él avié, etc. eventually collapsed was its utter atypicality as regards accentual distribution and the paradigmatic interchange of ía and ié, also its asymmetry with the parallel -ava schema. To these factors, add the disappearance of the very by-forms of the preterite whose analogy, in the first place, presumably launched the abortive development. This entire interlocking of causes and effects falls into place once we focus attention on the whole pertinent segment rather than on the easily misleading initial point of the trajectory.

Departures of such magnitude from the straight course are not frequently witnessed. The three specific complications in this instance which, understandbly, baffled pioneer scholars were the sheer temporal span of deviation - an estimated three centuries; the approximate coincidence of its initial phase with the beginning of records in the vernacular; plus the fact that after the mid-15th century the evolutionary line swung back almost perfectly into its original position, so far as that position can be adumbrated.

One afterthought: If the pressure of the pattern sufficed, after 1400, to wipe out the gains made by this internal contamination, why, we may ask, did this amount of pressure fail to block the interlude in the first place? Could it be that a rising glottodynamic movement has a greater impact and thus proves more difficult to ward off or to check than the same movement past its crest? The future may teach us to gauge such pressures with greater precision. Meanwhile, we shall do well to watch out for perplexing developments which are apt to yield to analysis once we grant that the initial points along the trajectories may suggest a misleading, uncharacteristic direction, in other words, that our operations, to bear fruit, require a generously placed cut-off point.

TEXTILES: THEIR USE AND SELECTION

The study of textiles is concerned with fabrics and the materials from which they are made. Asleep or awake, at work or play, sick or well, rich or poor, everyone uses textiles.[1] People wear clothing for various reasons: for warmth, for protection from the elements or hazards connected with their jobs, to make themselves more attractive, for status, for identification (armed forces, religious orders, and so on), and in some cases to conform to, or defy, the current social custom.

Textiles are widely used in the home. Floors are carpeted with textiles, sofas and chairs are upholstered, windows are draped, and beds are outfitted with textiles from mattress ticking to the bedspread with many different textile layers in between. Towels are used for drying purposes as well as for decoration in bathrooms and kitchens. Table linenes are used to provide an attractive background for the table service, for absorbing sound, and for protection of wood surfaces.

In industry, textiles have many uses; for example, conveyer belts, tapes, bagging, and pads to absorb sound. The automotive industry uses many textile products. Tires have a fabric or tire cord base, seats are upholstered, and floors carpeted with textiles.

Textiles are used for special purposes, such as to provide protection or ensure the proper living environment for air-space travel. There are more than 1,800 military uses for textile products.

Textiles are important in the world;s economy. All emerging countries develop a textile industry. When compared with 27 major industries in the United States, the textile industry ranks second in size, fourth in total number of manufacturing units, first in total number of employees, second in dollar wages paid, and third (steel and food rank higher) in total value added to raw materials.[2]

In the United States, about 15 million people receive their livelihood from textiles. In 1966, there were 7,500 textile plants in 42 states. The textile industry has made major contributions to the development of civilization. Animal husbandry, particularly the domestication and breeding of sheep, and the planting of seeds and growing of crops were in the beginning equally important for both food and fiber. The change from hand processes to machine processes, from home industry to the factory system, sparked the Industrial Revolution. The Jacquard loom, which operates from punch cards, was, perhaps, the start of automation. The development of man-made fibers has been a major contribution to the economy of all countries. They have made it possible to provide all kinds of fabrics in all price ranges so that consumers can buy a "fashion look" at low cost. The discovery that fibers could be synthesized from simple organic substances (nylon was the first fiber to be so prepared) ranks with the discovery of the wheel in its importance.

Because of the many changes in textiles, consumers need to know more about fabrics than ever before in order to make satisfactory choices. Desirable properties in clothing textiles are protection, esthetic appeal, durability, and ease of care. The relative importance of these properties depends on the specific end-use.

Different consumers want different properties for the same use. One person may place a high value on easy-care and will only buy garments that can be washed, dried, and worn without ironing; another person who likes crisp smooth textures will willingly give more time and energy to caring for garments. Some consumers want to care for their own garments; others depend on service organizations for reconditioning.

It is true of all fabrics that the performance and care required are determined by a combination of factors; namely, the fiber content, the yarn structure, the method of construction, and the fabric finish. For example, a blouse or shirt may be of cotton, wool, a man-made fiber, or a blend of fibers. The fiber or fibers used will determine whether it is hand washable, machine washable, or dry cleanable; whether it will wrinkle or be resilient; whether it will pill or shrink; whether it will be absorbent or water-repellent. The yarns in the garment may be absorbent or water-repellent, smooth or fuzzy, very fine or coarse, and have high twist or low twist. The structure of the yarn will contribute to resiliency, absorbency, shrinkage, and so on. The fabric in the blouse or shirt may be woven or knitted, which will determine its resiliency, absorbency, or shrinkage potential. The finish on the fabric may be durable or nondurable, and it may be visible or nonvisible. Different finishes give color, body, or surface beauty to the fabric, and they also may be used to compensate for lack of resiliency of fiber, yarn, or fabric construction, or to stabilize the fabric because of inherent shrinkage of the fibers or imposed shrinkage due to yarn and fabric construction.

The performance of garments is also dependent on trimmings, linings, and the like. The consumer should be aware that poor performance is not always due to the fabric itself but may be due to lack of compatibility of fabrics used together in a garment. For example, the cotton fabric of a blouse can be ironed with a hot iron, but trim of nylon lace is heat-sensitive and will melt or fuse at the touch of a hot iron.

Consumers must have basic information about fibers, yarns, fabric construction, and finishes if they are to select and care for textile products intelligently.

SUPREME COURT OF CANADA VERSUS THE SUPREME COURT OF BRITISH COLUMBIA: A CRITICAL SUMMARY

ATTORNEY-GENERAL OF BRITISH COLUMBIA ..... APPELLANT;

AND

ATTORNEY-GENERAL OF CANADA ..... RESPONDENT.

ATTORNEY-GENERAL FOR ONTARIO ..... INTERVENER.

ON APPEAL FROM THE SUPREME COURT OF CANADA.

Canada-Customs Duties-Importation of Liquor by Provincial Government-Property of Province-British North America Act, 1867 (30 & 31 Vict. c.3), s.91, heads 2,3;s.125.

Customs and other duties imposed by the Dominion of Canada upon alcoholic liquors imported into Canada can be levied upon alcoholic liquors imported by the Government of British Columbia for the purpose of sale by it. The power of the Dominion under the British North America Act, 1867, s.91, heads 2 and 3, to impose duties upon the importation of goods into Canada is not limited by s.125, which exempts the "property" of a Province from taxation.

Judgment of the Supreme Court of Canada affirmed.

APPEAL (No. 34 of 1923) by special leave from a judgment (October 10, 1922) of the Supreme Court of Canada (1), affirming a judgment (February 25, 1922) of the Court of Exchequer.

The action was brought by the appellants, who claimed that the Crown, in the right of the Province, was entitled to import goods into Canada from abroad for the purpose of sale in the Province, without liability to pay customs and other duties imposed by the Parliament of Canada in respect of the importation of goods of the kind so imported. The facts appear from the judgment of the Judicial Committee.

The British North America Act, 1867, s. 91, assigns to the Parliament of Canada exclusive legislative power in relation to: (head 2) "the regulation of trade and commerce," (head 3) "the raising of money by any mode or system of taxation." Sect. 125 provides: "No land or property belonging to Canada or any Province shall be liable to taxation."

The Court of Exchequer held that the Province was liable to pay the duties, and that judgment was affirmed by the Supreme Court (Davies C.J. and Idington, Duff, Anglin and Mignault JJ.; Brodeur J. dissenting). The proceedings on appeal to the Supreme Court are reported at 64 Can. S.C.R. 377.

1923. June 10, 12. Farris K.C. (Attorney-General of British Columbia) and Hon. Geoffrey Lawrence for the appellant, contended that the customs duties were "taxation," and relied upon s. 125. [Reference was made to Smith v. Vermillion Hills rural Council (1), and City of Montreal v. Attorney-General for Canada (2)]

Hon. Geoffrey Lawrence for the intervener supported the appellant.

Newcombe K.C. and T. Mathew for the respondent. The imposition of duties upon goods imported into Canada is not "taxation" within the meaning of s. 125, but falls within "the regulation of trade and commerce" (head 2 of s. 91); it is also authorized by head 3. The duties are not within the purview of "taxation" as that word is used in s. 125. But in any case s. 125 is not applicable, because the powers given by s. 91 are given "notwithstanding anything in this Act."

Farris K.C. replied.

Oct. 18. The judgment of their Lordships was delivered by

LORD BUCKMASTER. The question raised upon this appeal is whether there is power conferred upon the Dominion Parliament by the British North America Act of 1867 to impose customs duties or excise or sales tax upon goods when they enter the Dominion although they are the property of one of the Provinces. The case arises in the following way:-

The Province of British Columbia in 1921 established Government control and sale of alcoholic liquors by various statutes, enumeration of which is unnecessary. The Dominion Parliament, on the other hand, imposed customs or sales or excise duty upon, among other things, alcoholic liquors imported into the Dominion. In July of 1921 the appellant, acting as duly authorized agent under the British Columbia Liquor Act, purchased in Great Britain in the name and on behalf of His Majesty in right of the Province one case of "Johnny Walker Black Label" whisky, which was duly shipped from Glasgow and consigned to His Majesty in the right of the Province. Upon demand for delivery of this whisky the Collector of Customs, on behalf of the Dominion Government, refused delivery until payment of the customs duty and excise or sales tax. The appellant denied his right to claim these duties, and took the proceedings out of which this appeal has arisen to test his claim. The statutes under which it was claimed the right to impose such duties arose were the following: s. 3 and item A of the Customs Tariff Act, 1907; s. 2, sub-s. 3, of the Customs Act, 1917; s. 19 BBB, sub-s. 1, of the Special War Revenue Act, 1915; and s. 6, sub-s.1, of the Special War Revenue Act. 1915.

Nothing depends upon the language of these statutes. They admittedly embrace all consignments without distinction of consignee. The question is whether there was power so to legislate.

The Exchequer Court of Canada dismissed the appellant's claim with costs, and the Supreme Court, by a majority, have supported that judgment.

The real issue lies in determining the true meaning to be given to s. 125 of the British North America Act, which provides that "No lands or property belonging to Canada or any Province shall be liable to taxation." Taken alone and read without consideration of the scheme of the statute, this section undoubtedly creates a formidable argument in support of the appellant's case. It is plain, however, that the section cannot be regarded in this isolated and disjunctive way. It is only a part of the general scheme established by the statute with its different allocations of powers and authorities to the Provincial and Dominion Governments. Sect. 91, which assigns powers to the Dominion, provides, among other things, that it shall enjoy exclusive legislative authority over all matters enumerated in the Schedule, included among which are the regulation of trade and commerce and raising of money by any mode or system of taxation. The imposition of customs duties upon goods imported into any country may have many objects; it may be designed to raise revenue or to regulate trade and commerce by protecting native industries, or it may have the two-fold purpose of attempting to secure both ends; in either case it is a power reserved to the Dominion. It has not indeed been denied that such a general power does exist, but it is said that a breach is created in the tariff wall, which the Dominion has the power to erect, by s. 125, which enables goods of the Province or the Dominion to pass through, unaffected by the duties. But s. 125 cannot, in their Lordships' opinion, be so regarded. It is to be found in a series of sections which, beginning with s. 102, distribute as between the Dominion and the Province certain distinct classes of property, and confer control upon the Province with regard to the part allocated to them. But this does not exclude the operation of Dominion laws made in exercise of the authority conferred by s. 91. The Dominion have the power to regulate trade and commerce throughout the Dominion, and, to the extent to which this power applies, there is no partiality in its operation. Sect. 125 must, therefore, be so considered as to prevent the paramount purpose thus declared from being defeated.

The case is not dissimilar from the case of Attorney-General of New South Wales v. Collector of Customs, New South Wales (1), but it is unnecessary to examine whether the reasoning upon which that judgment depends can be made applicable in the present case, because, in their Lordships' view, the true solution is to be found in the adaption of s. 125 to the whole scheme of Government which the statute defines.

Their Lordships will humbly advise His Majesty that the appeal should be dismissed. In accordance with the usual practice in these cases there will be no order as to costs.

OBJECTIVES OF SOCIAL WORK

Within the framework of basic values that we have discussed, social work seeks to assist individuals, groups, and communities to reach the highest possible degree of social, mental, and physical well-being.[7] The methods of that social work applies to achieve this goal differ from those of other professions, such as medicine, law, the ministry, nursing, and teaching, because social work operates in consideration of all social, economic, and psychological factors that influence the life of the individual, the family, the social group, and the community. The members of other service professions, although they assume the duty of promoting the well-being and respecting the confidence of the individual whom they serve, focus their service upon one specific aspect of the personal needs involved.

Social work functions with the awareness of the dynamic interplay of personal, biological, and psychological elements with the socio-economic forces of the environment in which human beings live. In his diagnosis and planning to find solutions for problems of social adjustment, the social worker can not exclude any aspect of life of the individuals with whom he works nor any social condition that exists in the community where he operates.[8] This twofold approach of social work has been called "dualistic" - its aim is not only to help the individual, the family, and the group of persons in their social relationships, but it is also concerned with the improvement of general social conditions by raising health and economic standards, advocating better housing and working conditions, and constructive social legislation.[9]

The forerunners of social work-poor relief and charities-provided meager relief of palliative nature to the lowest class of society, the destitute and miserable. Traditionally, they gave financial aid for sustenance to the destitute, the blind and deaf-mute, the indigent, and the chronically ill. Bur social work today is losing its class character; its operations serve the betterment of all classes of the entire community. Social services increasingly assist people of all social levels, including individuals and families that are not economically dependent, and in a wide variety of social situations.

To perform this integrating function, social work uses the strengths of the individual and of the group, as well as the constructive forces of the environment. This task is achieved through social institutions, such as welfare agencies, schools, hospitals, clinics, employment services, churches, and the courts. They are the societal means to assist people who face economic or social problems in meeting the demands of their environment or in their personal relations. Some of these problems, arising perhaps from age, mental illness, or physical conditions, are such that individuals are unable to manage their own affairs.

The goal of social work is to reconcile the well-being of the individuals with the welfare of society in which they live. This objective precludes that social work attempt to force the people with whom it works to accept destitution, deprivation, humiliation as given facts and to adjust to conditions that are harmful, unjust, and depriving. Unlike early charity practice, modern social work no longer tries to make the client or the social group "acquiesce" in such conditions, but attempts to help them to get a clear insight that permits them first to face conditions as reality, and then to try to improve them. At the same time, social work attempts to mobilize social forces to resolve those social and economic situations that lead to ill health, mental suffering, frustration, and asocial behavior.[10] In cases of conflict, social work helps individuals overcome the difficulties they encounter in the right use of the facilities their environment offers, explaining to them the community resources created for their benefit.[11]

Among these objectives there is the effort to help the indigent client and his family to obtain a basic economic security through social insurance benefits, veterans pensions, public assistance payments, or voluntary social agencies support. Aid can also be made available by utilizing other community resources for employment, medical care, psychiatric treatment, cultural and educational advancement, vocational guidance, training, rehabilitation, as well as recreational opportunities. The integration of measures for financial assistance to people in economic distress requires careful consideration of individual psychological problems or health difficulties that may exercise pressure on the client and impair his normal development.

As social work recognizes the multiplicity of causation of social problems, it is concerned both with giving personal help to clients in need of service, and with measures that aim toward a change of the societal conditions that cause or contribute to human suffering and maladjustment. In working toward the social adjustment of the individual and of the group, social work needs to consider the cultural environment from which the individual clients or group members come. Their values may not be the same as those of the social worker himself or of a majority group that determines the policies of social work practice through its organizations. The objective of social work remains to help individuals and groups to find the best way for their satisfying accomplishments, without subduing them to conformity, unless their behavior and actions violate the well-being and rights of others. Unjust behavior and actions cannot be supported by social work. Based upon knowledge of the elements that determine human behavior, social work attempts to develop all constructive forces in the individual and in the social group that enable them to build for themselves a fuller, more satisfactory life. Social work assists them not only to solve their emotional, social, and economic problems by releasing their natural abilities and creative energies, but it encourages their active participation in working toward their self-selected goals.

BONDED FABRICS- ARE THEY A BLESSING?

IS BONDING a blessing? That's the consumer's big question when it comes to bonded fabrics. In spite of a great deal of uneven performance, bondeds are no longer a novelty. Women's garments made with them - high and low prices - fill store racks and a steadily increasing amount of over-the-counter fabrics are bonded. The industry has predicted annual production will reach 1 billion yards within the next few years in comparison with 50 million in 1962 and 400 million in 1967.

The blessings of good bonded fabrics are innumerable. They are almost wrinkle-free, and are durable, easy to sew, and retain their shape. Bonding can stabilize a stretchy or loosely woven fabric. It also makes a built-in lining or underlining that economizes time in cutting and sewing for both the home sewer and the garment manufacturer. Bonding makes clothing, especially wool, more comfortable because the under fabric is soft. Often it improves hand, drape, and appearance of a fabric.

However, for a product of such widespread use and with such great potential, the uneven quality of bondeds has been a nightmare to the consumer who has had no way of telling a good bonded fabric from a poor one. The National Institute of Drycleaning (NID), representing some 10,000 drycleaners, reported at one time half the complaints handled in its analysis laboratory involved bonded fabrics.

The four principal complaints against them are separation of the face fabric from the lining fabric (delamination); shrinkage; stiffening or change of hand after drycleaning and finishing; and adhesive staining.

What makes a good bonded fabric? Bondeds have and are improving. The bonding industry has realized that elimination of unsatisfactory products is the only way to keep its market growing. Its members have generally agreed on standards that were included in the revised L22 standards of the USA Standards Institute.

Good bonded fabrics must:

1. Hold up under a reasonable number of washings and drycleanings (various standards range from three to five);
2. Not crack, peel, pucker, or bubble;
3. Retain drape and breathability;
4. Absorb odor;
5. Resist discoloration;

6. Not stiffen;

7. Have no strike-through (staining) of adhesive;

8. Not shrink beyond a certain acceptable minimum (standards vary from two to three per cent for wovens and from four to five per cent for knits).

One of the critical aspects determining the quality of a bonded fabric is the selection of face and backing fabrics for balanced properties. The performance of bonded fabrics depends on the characteristics of both fabrics. Bonding a washable tricot to an unwashable face fabric will not make this fabric washable. A great responsibility, therefore, lies in the hands of the part of the industry that chooses two materials to be bonded and puts them together.

In another forward step, the various manufacturers in bonding have joined forces to form such organizations as the Fabric Laminators Association, an industry-wide group that was a leader in getting the bonding standards in L22. The FLA also worked with the NID in establishing the use of a coin-operated drycleaning unit as standard test equipment in textile laboratories.

Also, the Foam Fashion Forum was formed by the principal manufacturers of the polyurethane foam used in some bonded fabrics. The Tricot Institute of America organized to represent producers of backing fabrics for bonding. It has set up standards of cloth construction and weight.

This year an advisory committee representing the major trade associations in bonding was formed to enforce standards. Through education of manufacturers, it hopes to eliminate all inferior goods.

The most recent and biggest step in guaranteeing good-quality bonded fabrics has been taken by Coin International which licenses its bonding process to 31 companies (trade names include Coin-Tricot, Coin-Cel, Coin-Flex, Coin-It, etc.). The company, which has required its licensees to meet certain standards in bonding, has now developed a consumer guarantee that appears this fall on a hangtag on both ready-to-wear and over-the-counter bondeds made with the Coin process. The guarantee states:

"... This bond is guaranteed against separation of the face and back fabric in normal use for 'life expectancy' of the garment if care instructions shown on this tag are followed, and if the registration on the back is returned within 10 days (of purchase). If separation occurs, return the garment with this tag and the original sales slip to Coin. Garment will be replaced or credit for appropriate value made."

The responsibility for any failure has been placed on the bonder rather than the dress manufacturer or the retailer. A consumer will know that she has some recourse if the product she buys fails.

Another bonding licenser, Shawmut, which markets its process under the Twin-Set label, also has a guarantee hangtag. It states that if the bond fails during the "wearable life" of the garment, it can be returned to the store where purchasedfor exchange or refund.

Collins & Aikman introduced its Certifab Guarantee Program in 1968. It guarantees that the performance of a bonded fabric will be no less than the performance of the same fabric unbonded.

TYPES OF BONDEDS

Here are some of the types of bonded fabrics made today:

Tricot - Acetate or nylon tricot is permanently bonded to face fabric. This is the most popular type of bonding.

Foam - Urethane polyester foam is laminated to face fabric. A variation of this type of bonding is the adhesive bonding of a thin foam between two fabrics. This can be well utilized with washable fabrics.

Double faced - Two face fabrics are bonded to make a reversible fabric. This is used especially in higher-priced and designer clothes for special effects, ensembles, etc.

Cotton sheeting - To serve as a stabilizer and as an inner lining, especially for coats and suits, a cotton sheeting is bonded to the face fabric.

Vinyl - A clean double polished vinyl, available in different weights, is bonded to many types of fabrics for waterproofing.

Woven interlining - A woven wool interlining is bonded to a fabric to give better thermal qualities, body, and stability.

Non-woven - To add bulk and warmth, a non-woven fabric is bonded to woven face fabric.

Cotton knit - Various weights of cotton knit backing are bonded to suitable face fabrics to enhance absorbency, bulk, and drape.

Net - Nylon net backing is bonded to open-faced fabrics such as mesh, lace, knits. It retains the open look of the face fabric, while adding stability.

Batting - A polyester fiberfill batting is bonded to a face fabric. It eliminates the problems of shifting during drycleaning or washing and makes a soft, resilient fabric.

As quality control becomes an established fact in bonding, other strides are being taken. Collins & Aikman has added Certifab Plus to its line of backing tricots, which will aid in answering the big consumer plea for more washable bondeds. Certifab Plus fabrics are made of Celanese acetate and are colorfast in washing, something that

the industry has been trying to achieve for some time. This development should provide many more washable bondeds. The company said the new backing fabric, in 30 colors, is suitable to bond to face fabrics such as nylon, acetate, cotton, Dacron polyester, Orlon acrylic, and wool.

Another new process still in the experimental stages, is post-dyed bonded fabrics - goods that are dyed after bonding. The process will add more flexibility to the market as far as color is concerned.

HOME SEWING

Bonded fabrics for home sewing are appearing in increasing numbers - not only wools but laces, crepes, knits, and linen-type materials. They save time and are helpful to beginning sewers who don't want the added worry of putting in linings. Seam finishing is not essential with bondeds.

The most important factor in getting good results with bonded fabrics is in the selection. A fabric that is bonded off grain cannot be remedied with any amount of stretching or pulling. Hangtag and bolt instructions for care and fiber content should be read and followed carefully. A copy of the instructions is not often provided with yardage purchased. It is wise to take along a small writing pad, copy all instructions, and pin them to the fabric. The fabric should also be checked for evenness in bonding, any loose areas or puckering.

Here are some hints for sewing with bondeds:

- Put washable fabrics through wash/dry cycle before cutting.
- Fold fabric with wrong sides together so grain of face fabric can be seen when pinning.
- To avoid extra bulk, facings can be cut from lining fabrics; darts slashed and pressed open.
- Select machine needle according to the weight of the face fabric.
- Loosen tension and adjust pressure foot accordingly. Use 12 to 14 stitches per inch.
- When pressing on wrong side, use suitable setting for backing fabric.

A boon to the home sewer are the iron-on fusibles that make "stitchless" sewing such as Dritz Stitch-Witchery and Pellon's Wonder Under. Dritz expects to market its product in wider widths soon - it now comes 3/4" wide - aiming for future marketing of a 20-inch fusible net for full width bonding at home.

Iron-on bonding net is applied between layers of fabrics with a steam iron at the cotton setting. It becomes completely invisible. It is both washable and drycleanable and can be used for hemming, applying

facings, zippers, and trimmings. It can also be used to bond fabric to paper or wood.

What's in the future for bonding? The bonding industry will be looking toward new markets - broadening its scope in women's apparel, men's apparel, and home furnishings and looking for new resources in industrial fabrics for seat covers, tentings, outdoor coverings, protective fabrics, insulation, etc. The industry is already working to provide more lightweight bonded fabrics and more washable ones. With the new emphasis on industry-wide standards, bonded fabrics should continue to be an important part of the textile industry.

CORONARY PATIENTS AND THEIR FAMILIES RECEIVE INCOMPLETE CARE

The literature

Available knowledge concerning the educational needs of patients and their families following myocardial infarctions rests upon conclusions drawn from studes of widely varying orientation and quality. Few investigations have attempted to identify what the patient knows about his disease and therapy or his attitude to these.

Studies have indicated that during the acute phase of illness most patients show denial of heart disease and fear of death.[1] The threat to life and the complexity of the disease and its treatment result in patients becoming dependent on others to meet their needs. Knowledge becomes irrelevant or unnecessary to the dependent patient who has not yet acknowledged his illness; information given is not retained.[2] Investigators suggest the increased anxiety, identified in patients during periods of transition in care, may be decreased by preparation of the patient for transfer and discharge.[3]

Few patients have been found to succeed in altering health habits that may adversely influence their coronary disease. Several follow-up studies of patients with chronic illness have demonstrated the great frequence with which patients fail to follow medical recommendations.[4] Investigators agree in attributing this lack of compliance with prescribed health regimen to inadequate information about the illness and treatment and failure to understand the little information that was given.

The influence of the family in assisting the patient to accomplish the tasks of reorganization and rehabilitation was illustrated by Donabedian's findings that patients who had help available to them in the home were more likely to comply with medical recommendations.[5]

The effectiveness of patient and family education is influenced by the role expectations of members of the health professions, their preparation for teaching, and the system in which they function. The nurse can set the climate for patient teaching in both the hospital and the community.

Patients at home

During the initial period at home, most patients reported following their prescribed therapy. Acceptance of therapeutic measures was combined with fear for most of the patients and their spouses. The major source of apprehension was the limitation in physical activities. Lack of understanding of instructions contributed to this anxiety. One in three patients showed additional attitudes of defeat and resignation toward their physical limitations. Two in three spouses were apprehensive about their ability to follow the prescribed dietary measures.

Implications for nursing

Patients' apparent lack of concern for specific information about their hear disease and prescribed therapy during hospitalization does not negate the importance of this knowledge. The infrequency of requests for specific information may have resulted from insufficient understanding or fear of what they needed to know.

Some patients tended not to ask questions but indicated that they wanted and/or expected to receive information prior to discharge from hospital. Their inability to take the initiative in seeking necessary information was influenced by the stage of adaption to illness and by their apparent dependency on medical and nursing personnel during hospitalization.

Nurses should understand the physiological implications of the patient's psychological stress. Fear and apprehension were indicated by most patients on admission to hospital, and in relation to transfer and discharge. Information about the heart disease, hospital environment, and therapy, as well as better preparation for transfer and discharge, should decrease the emotional stress shown by patients during hospitalization and following return home.

The failure of health personnel to identify and meet the patients' learning needs probably contributed to their tendency to seek information from nonprofessional sources, resulting in the development of misconceptions about their illness and care. The misgivings expressed by the patients' spouses and the lack of information they received regarding posthospital care probably hindered their ability to provide the support needed by most patients.

Patients with previous history of heart disease appeared to be more aware of the effects of their illness on their families, resulting in a family becoming a cause for concern rather than a provider of support. Preexisting occupational and family problems appeared to assume greater importance to some patients and probably hindered their ability to cope with the illness and its residual effects. This illustrates the importance of knowing the patient as an individual and understanding his past experiences.

Variations in specificity of instructions appeared to account, at least in part, for attitudes of apprehension during the initial period at home. Patients reported they received fairly specific instructions regarding medications, which were clearly written on the medication bottles. Dietary restrictions were described in general terms but were accompanied by printed instruction sheets. Instructions about physical activity were vague and included: "take it ease," "slow down," and "be your own guide."

It would appear from these findings that much of the anxiety found in the patients and their families during the initial posthospital period could have been prevented by health personnel. If instructions given patients and their spouses prior to discharge had been more specific, and if continuity of care had been provided following discharge, patients

and their families would have felt less anxious.

Educational programs

There is need for more effective individual patient and family teaching and for the development of educational programs for groups of cardiac patients and their families, both in the hospital and on a continuing basis in the community. There is also a need to develop and make available authoritative reference material for patients and their families. This literature is required to reinforce and supplement teaching, to provide a written source of reference when patients are uncertain about their instructions, and to decrease patients' need to obtain information from the news media and friends.

Assisting the patient and his family to understand the patient's illness and therapy is a nursing function, in collaboration with other members of the health team. Continous evaluation and revision of patient teaching is essential to allow for changes in the patient's level of knowledge and need for different information during each phase of illness. Patient and family participation in the development and implementation of the teaching program should increase as the patient progresses toward recovery. Inservice education programs can better prepare nurses in the hospital and community for their teaching roles.

The use of clinical nurse specialists contributes to the improved quality and coordination of patient care and education. These nurses possess the knowledge and ability to assess patients' needs and to plan, implement, and coordinate patient and family education during hospitalization and the initial period at home. The clinical nurse specialist can also assist nursing staff to develop their teaching skills. Most of the nursing needs of the patients and family members during the initial time at home can be met by public health nurses or nurse practitioners with preparation in coronary care and patient teaching.

Nurses with special preparation in coronary care and patient teaching can develop and implement formal educational programs for groups of patients and their families in the hospital and the community. Effective programs would require cooperation among the nurse coordinators; physicians; nurses in the coronary units, general care units, and the community; dietitians; and other health personnel.

Coordination of hospital and community teaching programs can be assured by the use of the same personnel in both programs and/or the establishment of effective lines of communication between the two groups. Continuing programs for patient and family education following discharge from hospital could be conducted either in the hospital or in community health centers.

Summary

The findings indicated that the needs of study patients and their families for relevant information about their heart disease and prescribed

therapy were not adequately identified or met during their hospitalization or initial period at home. When specific instructions were given to patients and their spouses about prescribed therapeutic measures, they experienced less anxiety during the initial post-hospital period. When instructions were vague, increased anxiety was shown.

The patients progressed through identifiable phases of adaptation to illness with different kinds of information needed in the coronary care unit, on the general care unit, and at home. Some information provided within a few days of discharge was more meaningful than when given during the initial acute phase of illness.

Attitudes of most patients showed a recognizable pattern from the initial inability to accept the diagnosis to gradual acceptance of their heart disease and its residual effects. Fear and apprehension continued to influence patients' and families' adjustments during the initial period at home.

As nurses, we need to recognize our responsibilities as health teachers, to prepare ourselves to fulfill this role in the hospital and the community, and to develop means of ensuring accessibility and continuity of care and teaching for patients and their families, through all stages of illness and recovery.

A Genically Determined Abnormality in the Number and Arrangement of Basal Bodies in a Ciliate[1]

INTRODUCTION

One of the major problems in cell biology concerns the manner in which new basal bodies and centrioles are produced. Earlier hypotheses of direct self-replication of basal bodies (Lwoff, 1950) have been disconfirmed by subsequent ultrastructural investigations. As pointed out in a recent review, "In systems where new centrioles from next to preexisting centrioles, the new centrioles from adjacent to one specific end of the preexisting centriole but at a right angle to it and separated from it by 50-100 m_u" (Fulton, 1971, p. 187). Fulton applies this generalization to basal bodies, which are structurally similar to centrioles, as well. However, in some systems new basal bodies may form in other orientations, in other locations, and even in the total absence of intact old basal bodies (Fulton, 1981; Fulton and Dingle, 1971; Grimes, personal communication). The existance of a material contribution by old basal bodies to the formation of new ones is thus questionable.

In ciliated protozoa, much of the structural framework of the cell appears to be organized around basal bodies, also known as kinetosomes (Lwoff, 1950). These basal bodies and their numerous accessory structures are in turn organized into ciliary rows (kineties) and other structures of an even higher degree of compoundedness. The formation of new basal bodies within ciliary rows has been described in detail for Paramecium (Dippell, 1968) and Tetrahymena (Allen, 1969), and both provide prime examples for the mode of development summarized by the quotation from Fulton. In addition, in both systems new structures appear in a predictable geometrical orientation with reference to the old ones, so that a constant specific organization of the ciliary row is maintained through time. This spatial predictability is the basis of the hereditary continuity of preexisting pattern, which was classically demonstrated by Beisson and Sonneborn (1965) when they showed that an inversion in a ciliary row of Paramecium was faithfully propagated. This and other work led to the conclusion that the local "molecular geography" plays a determinative role in the formation and orientation of new basal bodies (Sonneborn, 1970).

As emphasized by Fulton (1971), understanding of both the function and the mode of formation of centrioles (and basal bodies) would be considerably enhanced if mutants could be obtained in which these properties are altered. Although mutants affecting flagellar structure and function have been obtained (Randall et al., 1967), no mutants specifically affecting centrioles or basal bodies have been reported. Cilates, in which basal bodies participate in an elaborate and specific geometrical system of organelles, are good organisms in which to look for such mutants.

This paper is a report of a genically determined abnormality in a ciliate, Euplotes minuta, which is characterized by a deficiency and sptial dislocation of new basal bodies. In it I will attempt to show that the abnormality is specific to early developmental events involving basal bodies, that it is probably controlled by a recessive allele at a single gene locus, and that this allele acts both to impair formation of new basal bodies and reduce the reliability of topographic ordering. One outcome of this condition is a high degree of instability in the vegetative perpetuation of the preexisting ciliary row number. The major significance of the findings to be reported lies in the implication that gene products intervene in specifying the microenvironmental controls of basal body formation, and that these controls are intimately related to the generation of certain larger structural patterns.

MATERIALS AND METHODS

The organisms used in this study were strains K_7 and VF_{17} of Euplotes minuta, supplied by Professor K. Heckmann. For the history of these strains, see Heckmann and Frankel (1968). Cells were cultivated by methods described earlier (Heckmann, 1963) using the marine flagellate Dunaliella sp. as a food source. The cilates were grown in tubes which were decanted and refilled with fresh food every other day to promote rapid growth. Details of procedure are described by Frankel (1973a). That paper should be consulted for methods used for estimating number of elapsed fissions and fission rates, and for performing crosses. Tests for killing activity were conducted as described by Heckmann and Frankel (1968). Experiments were performed at temperatures maintained between 19 and 22 degrees Centigrade.

Cortical features were assayed utilizing two methods. One was the Chatton-Lwoff silver impregnation technique, carried out as described by Frankel and Heckmann (1968). The other was the protargol method, which stains nuclei as well as basal bodies and fibrillar systems (Dragesco, 1962; Tuffrau, 1965; Zagon, 1970). Cells were fixed in Bouin's fixative and then prepared as described by Jerka-Dziadosz and Frankel (1969) with the following modifications: the film of Mayer's albumin in which the fixed cells were "enrobed" was kept on a warm plate at 40-50 degress Centigrade for about 10 min. and then transferred directly to a 1:1 formalin-absolute ethyl alcohol mixture, with no methyl alcohol step in between. Exposure to potassium permanganate was for only 1 min. in a 0.1% solution. This is adequate for oxidation, and prevents the peeling off of the albumin film after protargol impregnation which occurs frequently if a high concentration or longer time of exposure to $KMnO_4$ is utilized. Staining cells in 1% protargol at 45 degress Centigrade for 45-60 min. was found optimal.

Cultures were fixed for silver or protargol staining 16 hr. after being fed, so that dividing cells would be present. All cultures of a given series were fixed in the same short time interval. When numbers of cortical units were scored, cells were chosen which were not in stages of visible unit proliferation. Unlike the situation in Tetrahymena (Nanney, 1971b), in Euplotes formation of new ciliary units

occurs only in the latter portion of the cell cycle in clearly demarcated zones of proliferation (Fig. 1). Increase does not occur at other times and places (Wise, 1965; Heckmann and Frankel, 1968). Therefore all counts of units represent a static "preproliferation" stage, and comparisons can be made directly.

RESULTS

A. Normal Development of Ciliary Organelles in Euplotes minuta

There are four systems of ciliary organelles arrayed over the surface of the Euplotes cell. These are (a) the ciliary rows or kineties, (b) the oral system (membranelle band and paroral membranelles), (c) the ventral cirri, and (d) the caudal cirri. These are disposed over the cell surface as indicated in Fig. 1, frame I. Each ciliary row is made up of widely spaced cilia, each of which is inserted into a conical depression of the cell surface (Hammond, 1937; Roth, 1957).

These cilia (or "bristles") are short and nonmotile (Hammond, 1937). In E. eurystomus two adjacent basal bodies are situated at the bottom of each depression, one with a relatively long cilium and the other with a very short ciliary stump (Ruffolo, 1972). In their structural details the ciliary rows of Euplotes are homologous with those of other ciliates (Ruffolo, 1972), although functionally they may be vestigial.

The primary motor organelles of Euplotes are the ventrally situated membranelles and cirri. The membranelles consist of two or three parallel rows of ciliated basal bodies, while cirri consist of several rows of packed basal bodies which all possess cilia (Roth, 1957). Membranelles and cirri are both associated with abundant accessory microtubular and filamentous material (Gliddon, 1966; Grim, 1967; Tuffrau et al., 1968; Ruffolo, 1972). The prominent "anal cirral fibers" (Yocum, 1918) which are readily visible in light microscopical preparations (see Figs. 7,8,10, and 11) are particularly long bundles of accessory microtubules (Gliddon, 1966; Pitelka, 1968, Fig. 48).

The limitations of the light microscope make it impossible to resolve very closely spaced basal bodies; in particular, only a single granule can be seen at the base of each dorsal cilium. Hence, such granules will be referred to as ciliary units, since they mark the site of emergence of a single cilium. It is very likely that the number of such basal bodies is directly proportional to the number of these units.

The course of prefission development of ciliary organelles of E. minuta, based on observations of cells prepared by the protargol technique which has been ultrastructurally demonstrated to stain basal bodies and cilia (Zagon, 1970), is presented in Fig. 1. The sequence depicted is essentially the same as described for E. plumipes by Hufnagel and Torch (1967). The development of each of the four systems of ciliary organelles will be briefly described.

(a) Increase in number of units within the ciliary rows is restricted in space and time, occurring only within the equatorial zone prior to cell division (Wise, 1965; Heckmann and Frankel, 1968). Increase begins with the appearance of double units near the equator at stage III (Fig. 1) and continues to form longitudinally oriented files of units symmetrically disposed around a central discontinuity, the fission line (Fig. 1, stages IV and V). After division, the units of this proliferating zone will occupy the posterior two-thirds of the anterior division product and the anterior two-thirds of the posterior division product. The ciliary units outside of the proliferating zone come to occupy the anterior and posterior extremities respectively of the two division products. In protargol preparations there is no evidence of resorption of units of the ciliary rows during any stage of the developmental process.

(b) The oral primordium initially appears posterior and to the cell's left of the old membranelle band. Development occurs within a cavity beneath the surface (Wise, 1965). The new membranelle band emerges onto the cell surface during division and forms the feeding structures of the posterior division product, while the old oral structures are retained intact by the anterior division product (see Wise, 1965, for details of oral development).

(c) The dividing cell elaborates new cirral systems for both fission products, after which all of the preexisting cirri are resorbed. The cirri here termed "ventral cirri: (Fig. 1,I) develop from a single primordial system, which initially appears as two sets of five rows each of basal bodies arrayed over the ventral surface (VCP in Fig. 1, II). These rows do not form in close contiguity with old cirri, which remain intact until much later. The rows develop into narrow fields of basal bodies, which become demarcated into cirri (stage III) which then enlarge (stage IV) and subsequently spread over the ventral surface (stages V-VI). Studies using the Chatton-Lwoff silver technique show that this spreading is accompanied by growth of a "neonetwork" of silver-staining membrane differentiations (Wise, 1965), suggesting a process of new membrane growth (confirmed by scanning electron microscope - Ruffolo, 1972). Old cirri are progressively resorbed as the new ones come to occupy their formed places (Fig. 1,V,Vi).

Fourteen of the fifteen new ventral cirri develop from the above-mentioned five rows of granules. A fifteenth forms from a small cluster of basal bodies appearing just to the cell's left of these rows (Fig. 1, III). This later becomes a part of the expanding system of nascent ventral cirri.

Cilia and subpellicular fiber systems grow out as the cirri mature and spread over the surface (stages IV-VI).

(d) The new caudal cirri arise from two sets of primordia which are distinct from the ventral cirral fields and also from each other. The two left caudal cirri (LCC, Fig. 1,I) develop in stages III-IV from primordia situated near the left edge of the ventral surface between

the oral primordium and the first ciliary row. Primordia of the right caudal cirri (RCC, Fig. 1,I) initially appear on the dorsal surface, within the two farthest-right ciliary rows. Units at the posterior end of these rows in each incipient daughter cell undergo proliferation in situ to form cirri between stages IV and V (RCCP, Fig. 1,V). During cell division these new cirri come to lie on the posterior right quadrant of the ventral surface and replace the old right caudal cirri.

The new ciliary structures do not appear simultaneously. The oral primordium is elaborated first, then the ventral cirral primordia, then the left caudal cirral primordia and the new units of the ciliary rows, and last of all the new right caudal cirri. These processes occur at the same time as macronuclear reorganization (replication) (Fig. 1). The morphogenetic movements which distribute new ciliary organelles over the surface of the daughter cells occur, in large part, subsequent to the differentiation of these organelles, in the period just before and during cell division.